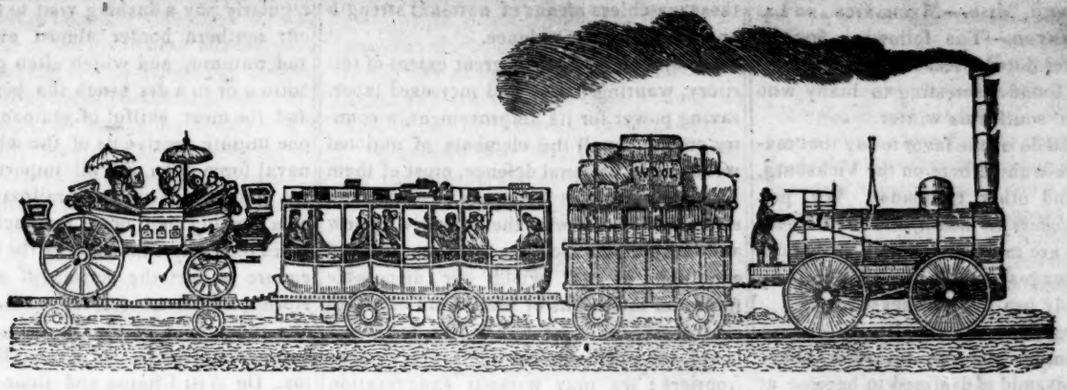


# AMERICAN RAILROAD JOURNAL,

## AND ADVOCATE OF INTERNAL IMPROVEMENTS.

PUBLISHED WEEKLY, AT NO. 132 NASSAU STREET, NEW-YORK, AT FIVE DOLLARS PER ANNUM, PAYABLE IN ADVANCE

D. K MINOR, and GEORGE C. SCHAEFFER, } EDITORS AND PROPRIETORS.]

SATURDAY, OCTOBER 15, 1836. [VOLUME V.—No 41.


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AMERICAN RAILROAD JOURNAL.

NEW-YORK, OCTOBER 15, 1836.


### TO RAILROAD CONTRACTORS.

PROPOSALS will be received at the town of Lindon, until the 20th day of December next, for the graduation of the Lindon Railroad. A profile of the route, with plans and specifications of the work, will be exhibited at Lindon, for ten days previous to the letting, and all other information given on application to the subscriber, or the Assistant Engineer.

PROPOSALS will also be received at the same time and place, for furnishing and delivering at Beckley's Landing, 95,000 feet (L. M.) of long leaf pine or cypress scantling, sawed 5 by 9 inches, to be free from sap, knots or wind shakes, and 20, 25 and 30 feet long. Also 60,000 feet, or more, (L. M.) of white, or post oak scantling, sawed 5 by 7 inches, length to be specified hereafter, and 60,000 feet (L. M.) of white or post oak plank, 2 inches thick, 9 foot wide and 15 feet long.

Also for furnishing and delivering on the line of the road 10,500 undressed post oak logs, 8 feet long, and 10 to 15 inches in diameter.

Also for furnishing and delivering 3,160 post oak caps, dressed 8 by 10 inches, 8 feet long, and 6,320 post oak posts, dressed 10 inches square and of lengths hereafter to be specified.

Recommendations will be expected in all cases, of persons not known to the officers of the Company, or to the Engineer. For the information of persons at a distance, I would state, that the Lindon Railroad commences at Beckley's Landing on the Tombeckby River, a stream navigated by Steamboats the greater portion of the year;—and having a direct communication with Mobile and New-Orleans will afford the facility of procuring supplies and implements necessary for the hands employed on the work, or their ready conveyance hither, if procured at a distance.

Persons having mills on the river and disposed to contract for furnishing timber, will have the facility of delivering it by water communication. The country through which the road passes, being perfectly healthy, and the mildness of the climate admitting of operations throughout the winter season, renders the contract peculiarly desirable to those wanting winter employment.

D. H. BINGHAM, C. E.

Lindon, Ala., Sept, 17, 1836. 41—3t

### THE NEW-JERSEY, HUDSON AND DELAWARE RAILROAD.

NOTICE is hereby given that under and by virtue of an act of the Legislature of the State of New-Jersey, entitled, "A further supplement to an act to incorporate the New-Jersey, Hudson and Delaware Railroad Company, passed the 8th day of March A. D., eighteen hundred and thirty-two," the books to receive subscriptions to the Capital Stock of said Company will be open at 10 o'clock, A. M., of each of the days following, viz:

On Tuesday, the 8th Nov. next, at Joseph Tilman's, Columbia, N. J.

Wednesday and Thursday, 9th and 10th Nov. next, at John J. Blair's, Gravelhill, N J.

Friday, 11th Nov., at George Crockett's Marksboro, N. J.

Saturday, 12th Nov., at Peter B. Shafer's, Stillwater, N. J.

Monday, 14th Nov., at John S. Warbasse's, Newton, N. J.

Tuesday and Wednesday, 15th and 16th Nov., Abm. Brav's, Augusta, N. J.

Thursday, 17th Nov., at Stephen Ward's, Hamburg, N. J.

Friday and Saturday, 18th and 19th Nov., at H. Vibbert's, Dechertown, N. J.

Tuesday and Wednesday, 13th and 14th Dec., at United States Hotel, Newburgh, New-York.

Thursday, 15th Dec., at No 34 Wall-street, city of New-York.

And continue open at the last mentioned place until the whole stock shall have been subscribed for, or at the discretion of the Commissioners. But if the whole of the Stock shall be subscribed for at either of the above mentioned places, the books will be immediately closed.

The Capital Stock is $500,000 with liberty to increase to $800,000, divided into shares of $100 each.

The sum of $5 on each share is required to be paid on subscribing.

SAMUEL FOWLER,
JOHN BELL,
JOSEPH CHANDLER,
WILLIAM HYBERGER,
ENOS GOBLE,
DANIEL HAINES,
SAMUEL PRICE,
JOHN I. BLAIR,
JOSEPH E. EDSALL,
COMMISSIONERS

Dated Oct. 3rd, 1836. 41—3t

NEWBURGH BOAT RACE.—On Saturday afternoon, of the 8th instant, came off at Newburgh, a beautifully contested Boat Race, between the "HIGHLAND WAVE," the "WHITE LADY," and the "BACHELOR." The point of starting was four miles above the steamboat dock at Newburgh, and the judges at the starting point were Captain Wiltsie and A. Noyes, Esq.; and Capt. Robinson, late of the Havre packets, was the judge of the result.

The distance rowed was four miles, and the time 21½ minutes.

The afternoon was pleasant, and a large number of spectators were assembled to witness the performance, which was, indeed, one of deep interest—affording at the same time ample evidence of the importance of such associations in the promotion of health and the most manly exercises among our young men.

The "*Highland Wave*," a beautiful new boat, came in about two lengths ahead—the "*White Lady*" next, and then the "*Bachelor.*"

The length of the boats was as follows: the Highland Wave, 35 feet; the White Lady 26 feet; and the Bachelor 26 feet 6 inches—each having six oarsmen and a coxswain.

To the observers it was evident that the winning boat was as much indebted to its *bottom*, as to its manly crew—and also, that the sturdy crew of the White Lady, with equal *bottom*, would have been in a very different position at the termination of the race. It was also evident that the blue shirts of the Bachelor were equal to almost any task, except that of giving their craft, with its exceedingly unpopular *name*, (at least with the ladies,) a leading, or *winning* position. They should by all means call it the "*Beau*," and we would warrant it to win—*admirers* at least.

VICKSBURGH, MISS.—MECHANICS AND LABORERS WANTED.—The following extract from a letter dated *Vicksburg, Miss.*, Sept. 16, will be found interesting to many who desire to go south this winter.

"Will you do us the favor to say that many men are wanted here on the Vicksburg, Jackson and other railroads. We pay *twenty-six dollars per month*, and board them. Carpenters are in great demand, to whom enormous wages are paid. The country is remarkably healthy this season.

Vicksburg, is more rapidly improving than any other place on the river above New-Orleans, and is destined to become at no distant day a place of importance. The packet ship Vicksburg arrived last week from New-York, and the Gazelle from Philadelphia, is expected to-morrow, and others are on their way, and nothing so much retards the growth of the place as a want of mechanics."

Yours truly."

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The following letter from a distinguished officer offers ample testimony as to the value of railroads in a national point of view.

He has had frequent opportunities in his own experience as to the benefit and advantage of such a system of railroads.

HEAD QUARTERS, WESTERN DEPT.
Camp Sabine, Aug. 15, 1836.

SIR—Having recently looked into your Railroad Journal, and among others, one for the 59th anniversary of our Independence, a paper that had long lain in my desk without being noticed. I cannot deny myself the pleasure of tendering to you the slender tribute of this letter (with the enclosed ten dollar bill,) expressive of my approbation of your labors in the glorious cause of *internal improvement*, and my unfeigned desire that you will continue the publication of your excellent Journal; and that you may soon find in a quadruple subscription list the most irrefragable evidence of the near approach of that hallowed dawn of broad daylight which the virtuous and wise of every farm-house, and every cabin, of the central, western, and southern States of our beloved country, have long and ardently hoped would soon appear, with schools and Railroads to dispel the clouds with which the *spirit of party* has long threatened to annihilate our anxious and fond hopes that man is indeed capable of self-government.

Hitherto we have proven that we are capable of profiting, but partially profiting, by the noble examples and wise precepts of our Fathers of the Revolution. They gave us freedom and with it a charter for *self-government*, embracing every essential provision for *self-defence*, and *self-preservation*. These are to a great extent abandoned by the votaries of party spirit, and by those who disregard labor schools, and railroads and canals, and steam power, and sustained only by those who have labored in favor of these matchless means of national strength and national independence.

Occupying as we do a great extent of territory, wanting hands and increased labor-saving power for its improvement, a country embracing all the elements of national wealth, and national defence, most of them unwieldly without railroads, canals and steam power, but with them, by giving new and incalculable facilities to commerce, and enabling us to wield our disposable force and munitions of war, from our two central and other western States, to the sea board, and north-eastern and south-western frontiers; we may without exaggeration assert that the accomplishment of these works will render our whole country *invulnerable in war*, and afford an increasing revenue *in war, and in peace*, that will ensure to us in from *six to twelve years, an amount of money equal to the whole expenses of their construction*.

A revenue to be derived from our internal means of transportation *during a state of war!* my enemies say "no, this is not possible. Your calculation is incorrect—your theory is visionary. You can find no practical results to sustain you."

I answer that the northern and eastern States already abound in practical results sufficient to sustain me, that in the war of 1812, '13 and '14, some hogsheads of Louisiana, sugar and some bales of cotton and casks of rice, found their way from the south, up the Mississippi and Ohio rivers, and thence across the mountains to Pennsylvania, Maryland and New-York, without the aid of railroads or steam power; that many of the valuable products of these States found their way to the south: and that they were much needed throughout all the southern and western States, and that with a system of railroads leading from the central and western States to the sea board, such as I have proposed to be constructed by the army during periods of peace, every section of the United States would be supplied in war and in peace with domestic products and the fabrics of home manufacture to an extent quite sufficient to produce a respectable revenue. I add that we have nothing to fear from a war with any nation other than such as may be sustained by some new tripple or quadruple alliance of European powers, who may bring to our shores an overwhelming naval force sufficient to annihilate our commerce with foreign countries, and to cripple our navy, even though it should be made as great as our *fresh water* seamen with our *land Secretary* have proposed to make it. Our navy I am sure can never be beaten, and compelled to remain beaten, by that of any other nation without a series of conflicts that will cover it with imperishable fame. But the fame of the dead will not afford to the living, present *immediate protection*. Our navy may be destroyed by superior force The devouring hurricane and tornado which regularly pay a dashing visit to the seas of our southern border almost every spring and autumn, and which often carry to the bottom or to a dry beach the best of ships and the most skilful of seamen, might in one minute deprive us of the whole of our naval force upon our all important southern station. Whilst our railroads and canals costing not more for each hundred miles than a first rate ship of the line, would endure unhurt the pelting of a thousand storms, and would forever stand as a glorious monument of the wisdom, enterprise and industry of Oliver Evans, Robert Fulton, De Witt Clinton and their followers, as long as our mighty rivers and mountains retain their positions and majestic forms.

Our navy may be destroyed—suddenly annihilated and with it our foreign commerce. Then without railroads leading from the central States to the frontier, we should be left at the mercy of a merciless foe! whereas with the proposed system of railroads, we may in any event contemplate with proud satisfaction the obvious security, accommodation and comfort which they will afford us at our firesides and throughout our domestic relations.

The loss of a fleet at sea, or of several fleets in succession, added to the loss of our foreign commerce, whilst threatened by victorious foreign fleets and armies arrayed against us from *without*; having our railroads and land forces held ready for action *within*, we should find perfect security and retain the sure elements of prosperity throughout our national domain. Whereas if we give up the proposed system of railroads, *the loss of our fleets would in effect be nothing less than the loss of our national existence.*

Having the sure means which the proposed system of railroads will afford, of assembling at any one threatened vulnerable point upon the national frontier, within 60 to 70 hours a great part of the disposable force of the western States, amounting already to upwards of a million of men; this will make us *feel secure*—it will make us feel and see clearly that we shall occupy the *position, and maintain the attitude of proud defiance towards our enemies, numerons as they may be.*

We should then see the *sugar, cottan, rice, coffee, lead* and *iron* and other valuable products of the south and west, with thousands of passengers of the south and west, flying under the giant grasp of steam power with its thousand cars per day; and we shall see equal numbers daily returning richly laden with northern and eastern products, and northern and eastern manufactured articles of merchandize, with northern and eastern merchants, engineers, scientific mechanics and other passengers of that delightful region of our country.

This process must and *will* create a revenue *in time of war sufficient to meet the prin-*

*cipale xpense of the war* and expense be reduced as it will in the great item of *transportation* to a saving of nine dollars out of every ten, or nine hundred thousand dollars out of every million, whilst the same cars will be occasionally employed in wielding the disposable force of all the western States—but more especially of the two great central States of the west, *Kentucky and Tennessee (every young man of which States will be disposable, because these States unlike all the remaining 24 have no exposed frontier, and hence all their force is disposable,)* together with all the disposable munitions of war of all the western States. Hence it will be found that my system of railroads from the central States to the sea board and north-east and south-western frontiers will contribute to render the United States *invulnerable in war* and enrich them in peace, inasmuch as it will save nine tenths of the expense *in money* and *in time*, in every movement to and from the theatre of the war; taking into view the unavoidable expense which the past and present character and condition of our railroads and means of land transportation in the central, western and southern States would require.

The proposed railroads after affording every desirable facility for the most vigorous and successful defence of the country in war, and affording also a revenue sufficient to pay much of the expense of the war, will, on the return of peace, when all other of the most expensive means of national defence known to this or any other nation, such as grand fortificatons, armories, arsenals, with cannon and most other military stores (however essential in war,) become useless or more than useless during a state of peace, because they require constant repairs and an expensive force to take care of them. When these become useless or unprofitable, railroads with steam power applied to vehicles of land transportation, taking, as they must take precisely the direction which the principal commerce of the country takes, viz: from the sea board to the central and western States, they will then afford a revenue that *will grow with the growth of our population, and as bonds of union and concord to the States and the people, will strengthen with our strength*, until every acre of our soil, and every valuable mineral of our mountains, and every moment of our time, and all our attainments, with every effort of our labor and industry will increase in value from one hundred to ten hundred per cent. We shall then *see and feel the value of practical science, and of increased civilization, with self government.*

We shall then have it in our power, speedily to put an end to every description of war near us, which tends to disturb the harmony of the civilized world, and we shall give civilization to our neighboring savages of all colors; and we shall give *freedom* to all who we find to be capable of its enjoyment, or in other words, capable of *self-government. No other ought to be free*—NO OTHER CAN BE FREE, WITHOUT BREAKING IN UPON, AND JEOPAEDIZING THE SUREST AND BEST ORDER OF UNIVERSAL CIVILIZATION.

Be assured dear Sir, of my best wishes for your health and entire success.

EDMUND PENDLETON GAINES.

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Extract from a letter dated

AVOYLLE FERRY, ON RED RIVER. }
Sept. 8, 1836. }

D. K. MINOR:

DEAR SIR—Enclosed you will receive the Meteorological Record for the months of July and August, 1836, regularly entered as stated.

I have received of the present year one number of the Mechanics' Magazine for the month of February, and no other, until yesterday. I received the number for the month of June, Vol. 7. No. 6. whole number 42, at the same time. One for the month June, 1835, Vol. 5, No. 6, whole number 30. Making a difference in their passage of precisely one year. The Railroad Journal has been received in about the same proportion. I also received by the same mail from Washington, a number of papers, documents, &c. of different dates from January 28th, up to July 6th. From this circumstance, I hope one Post Office on the route is forwarding what they have had on hand more than twelve months back.

Most respectfully yours,
P. G. V.

P. S. *Our crops* of cotton in all this section is superior to any former crop; and owing to the continued additional improvement in extending former, and making new plantations on Red River, and tributaries, will be much larger, if the season should be favorable for picking. We have had a shower every day, for nine days past, which impedes the picking, and if they should continue long will be a disadvantage to the *crop*.

Our crop of corn has turned out generally good.

Your most ob't servant,
P. G. V.

☞In relation to the *irregularity* of the mails no one thinks of speaking now a days. The period *was* when it was not an *uncommon* thing to get letters and papers about the time when they were due, but at this time it is quite another affair. It may however be proper to say that they have *all* been forwarded.

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ANNUAL REPORT OF THE PRESIDENT AND DIRECTORS TO THE STOCKHOLDERS OF THE LEXINGTON AND OHIO RAILROAD COMPANY, MAY, 1836.

The President and Directors of the Lexington and Ohio Railroad Company submit for the information of the Stockholders, the following statement of its affairs.

Since the organization of the Company in the year 1830, and the commencement of the work the year following, twenty-eight miles of the roadway only have been completed and put in use. Want of experience in the location and construction, and a deficiency of means arising from a difference of opinion among some of the stockholders as to its effects upon others interests, have retarded its completion; but these difficulties no longer exist, and it may be expected to progress more rapidly in future.

The original objects of those who projected this important work, have been kept steadily in view by the Board of Directors. Efforts to confine the operations of the Company to a few interior counties have been successfully resisted, by an appeal to the justice and liberality of the Legislature; [see appendix No. 1 and 2.] the co-operation of the City of Louisville has been obtained, and doubts no longer exist as to the certain extension of the whole line of Railroad to the Ohio river, at Louisville, by which the commerce of that flourishing emporium will be more closely united with the trade of Lexington and the interior, the charges of transportation will be greatly reduced to the producer and consumer, and new life and vigor imparted to the industry and enterprize of our community.

When the plan of construction was first adopted it was thought, that continuous stone sills for the superstructure, although not the cheapest, would be found to be better than wood. The whole line furnishing an abundance of limestone, of a quality deemed sufficiently solid and durable, that material was chosen in preference to the wood sleepers. It has been found however here as well as elsewhere, that this preference was erroneous.*

Besides the greater cost, it has been found that stone sills will not bear for any length of time the action of the machinery used for the transportation of freight; the surface in contact with the iron plate rail is so liable to wear and crumble, that constant attention is necessary to keep these sills in repair, and a great increase of the requisite motive power from the same cause has been found indispensable.

Twenty odd hands and two superintending engineers have been constantly employed on the repairs. The heavy expense thus necessarily incurred has been chiefly confined to the stone sills and embankments; the wood superstructure being found as sound and perfect as when first laid down.

The mode of repairing adopted to meet the emergency of the case, is to remove the broken particles of the stone and redress the surface of the sills, so as to admit a

*The President and Directors of the Baltimore and Ohio Railroad Company, in their last Annual Report, say—"The wooden string piece and sleepers, with a plate rail 2½ by 5 8 inches were first laid down; then stone blocks were substituted in place of the wooden sleeper; then the log rail was used; and then the continuous stone string piece was devised, and considered the perfection of the system. Experience proved that of these four modes, the first was decidedly the best, and the last decidedly the worst." This is also our experience.

sat of oak two inches thick under the iron rail. This has been found to answer a good purpose, and the road has thus been improved; but a more permanent plan must sooner or later be resorted to. The embankments generally have been enlarged and are in good order. Every thing that could have been reasonably expected has been done during the past inclement winter to keep the road in repair, and to continue to accommodate the public.

In the construction of the remainder of the line from Louisville to Frankfort, wood string pieces will be used to the exclusion of stone sills. It has also been determined to grade that portion of the line for a double track, with a view to lay down a second line of rails as soon as practicable after the completion of the first.

An accident unfortunately happened in March last which caused the loss of lives—an occurrence, although unavoidable, deeply to be lamented. It had been the aim of the Board to employ none but competent agents. The utmost confidence was reposed in the judgment and discretion of the manager of the train of cars; the engineer in charge of the locomotive was known to be skillful and attentive, and for greater safety the speed has uniformly been less than on other Railroads. Notwithstanding these precautions, on the occasion alluded to, the flanches of the wheels of the engine while passing at the usual speed over an embankment, lost their hold upon the rails, and before the breaks could be used the engine and several cars, (one of them containing a large number of passengers,) were upset and broken. Two individuals were killed and several wounded. It is probably not within the scope of human invention to devise a mode of travelling entirely free from all hazard. Little subject as ours is to accidents of any kind, yet, greater security may be attained by longer experience; but a higher sense of responsibility or more zealous efforts to discharge all the duties of their respective stations, cannot be expected from agents. In consequence of the respectability of the sufferers and the novelty of the occurrence, public attention has been particularly directed to it, while Stage and Steamboat accidents, happening almost daily, are but little noticed and soon forgotten. The Board are perfectly satisfied, that this accident was not caused by carelessness or neglect.

Since the opening of the road to the head of the Inclined Plane at Frankfort, at the beginning of last year, a train of frieght cars propelled by a locomotive engine imported from England, and a line of horse cars for the conveyance of the mail and passengers, have been in use. There has been a gradual increase of business of every description, but no inconsiderable portion of the trade of this section is still carried on in the old way, and will continue to be, until the line shall be completed to Louisville, particularly at those seasons of the year when the Kentucky river ceases to be navigable. An arrangement is in progress to secure the transportation of the manufactures of this city during the summer, which it is believed will be successful.

In the course of last year a machine shop of considerable extent was established, at the head of which Mr. CHARLES B. LEWIS, a skillful artizan, was placed. Under his direction our freight and passenger cars have been constructed on an improved plan. The business of transportation generally has recently been under the management of the same individual, to whom we are indebted for the introducrion of a system which has greatly facilitated the business. His practical knowledge has enabled him to adapt the machinery to the road, and to make from time to time such alterations as observation and experience might suggest.

Want of iron for the machine shop and delay in receiving a new locomotive purchased in January last, retarded the business of the shop, and rendered incomplete the system of organization which had been devised for the transportation.

From the causes mentioned the cost of machinery and the amount of motive power necessary for the business of the road, as well as the expense of repairs, have greatly exceeded the calculations.* To meet this unexpected increase of expenditure, an act was passed by the last Legislature in conformity with a memorial on the subject, authorising a small increase of the rates of transportation. The charges are still low, being about half the usual rates of wagonage on the Turnpike roads.

If we have miscalculated in some items as to the expenses of our work, we have assurances that the amount of business, both in freight and passengers, when the road shall be completed, will also greatly exceed the estimates; when that is accomplished the stockholders will derive full compensation for their investments. In the meantime they have the satisfaction to know, that the public have been greatly benefitted by their enterprize; that impulse has been given to the spirit of public improvement in all parts of the State, and that the products of the country will soon be relieved from all unnecessary burthens in reaching a market. Along the line of a railway between Lexington and Frankfort, the salutary influences of the work are felt and appreciated, and it will be rendered still more useful by the erection of one or two warehouses as depots for produce.

Additional turnouts have been recently constructed at convenient places, between the regular stations, with a view to facilitate the way transportation. An engine house at the head of the Inclined Plane, two wood houses, and buildings to inclose the water cisterns, are yet to be erected.

About one fifth of the entire cost of transporting freight on the line, is expended at the Inclined Plane. The propriety of re-locating part of the road at some future time, so as to avoid the expense and loss of time caused by this obstruction, is worthy of consideration.

The mode of using this Plane by extra horse power, is considered the most economical that can be adopted. A cheap and simple mcahine, invented and constructed by Mr. LEWIS, which he calls *a slide break*, has rendered the operations on the Plane as safe as on any other part of the road. An experiment accidentally made when it was first used in January last, so fully established this fact, that it cannot be doubted.

A subscription for two thousand shares of the stock by the city of Louisville, and a like subscription by the Board of Internal Improvement on the part of the State, in pursuance of an act of the last session, have placed the company in a situation to prosecute the work to its termination at the Ohio River. A call of ten per cent. on the subscriptions of the city of Louisville has been paid, and the payment of ten per cent. of the subscription of the State satisfactorily arranged.

The Engineer corps having been re-organized and enlarged, is now under the direction of Capt. THOMAS F. PURCELL, a gentleman possessing the requisite science and experience to conduct this important department. Since he commenced his examinations of the route in April, with a view to the final location and lettings, several additional lines have been run, between Bear Grass Creek near Louisville, and the high ground in the vicinity of Middletown, all of which have been found eligible. The selection of the best route will be immediately made and twenty miles of the road placed under contract next month. It is intended at the same time to let the building of the bridge across the Kentucky river at Frankfort—the plan of which will be adopted to general purposes under the act of last session which authorises the erection of a toll bridge by the company.—(See Ap. 3.)

A thorough examination of that portion of the line on Benson creek, made by Professor LUTZ last year, established the important fact, that an inclined plane on the south side of the Kentucky river could be avoided by a small increase of the original grade. The examinations made of the Louisville end of the line by Capt. PURCELL show, that a like increase of the grade, say from 30 to 50 feet, in the neighborhood of Bear Grass Creak will enable him to enlarge the curves to any desirable extent, and to make the location nearly in a direct line.

One of the objects of the reconnoisance of Professor Lutz, was to find a practicable route leading through the town of Shelbyville. After devoting much time to this survey he was compelled to report unfavorably. The deep interest felt in this matter by the citizens of the town of Shelbyville, induced the Board to order this experimental line to be run, with a view to accommodate those friendly to the work. The same motive will prompt them to adopt any change in the location, that may not be detrimental to the interests of the company, which future examinations may point out.

The Board have carefully avoided the acquisition of real estate beyond the wants of the Company. Two farms purchased in Woodford to obviate difficulties as to the

*It has been a common error to underrate the cost of motive power and repairs of machinery. 'The annual expense of working a locomotive engine on the Liverpool and Manchester Railway is stated to be £2107 14s. instead of £270 12s. 10d as at first supposed it would have been.'

right of way, have been in part disposed of. One of them has been laid off into town lots; from the improvements already made it promises soon to become a village of importance to the neighborhood in which it is located.

The accompanying Tables marked A. B. C. D. E. show the sums received for the transportation and freight monthly, since June, 1835, the total amount of expenses during the same period, a general statement of the receipts and expenditures, and a description of the freight. The documents 1. 2. 3. 4. referred to in this report, are also annexed.

THOMAS SMITH,

President Lexington and Ohio Railroad Company.

May 14, 1836.

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APPENDIX.

No. 1.

TO THE HONORABLE THE LEGISLATURE OF KENTUCKY. THE MEMORIAL OF THE PRESIDENT, DIRECTORS, &c., OF THE LEXINGTON AND OHIO RAILROAD, RESPECTFULLY SHOWETH:

That ever since the organization of the Company in the year 1830, under a charter of the Legislature, the best efforts of the stockholders and their officers have been faithfully and assiduously devoted to the execution of the work, and to the attainment of the great public benefits expected to result from its completion. But owing to several causes they have not been able to obtain the requisite funds to progress with the work as rapidly as the public interest required.

While doubts existed in the public mind as to the practicability of constructing a railroad on the line proposed from Lexington to Louisville, the stockholders resolved to persevere upon their own resources and at their own risk, relying upon their success to remove objections and secure to their enterprize a just share of public favor. They have at length accomplished their primary object. The capital and public spirit of the citizens of a single town, almost unaided, have not only proved the practicability and great value of railroad communication in this as well as other States, but by their example they have given an impulse to other works of the same character and to the great cause of internal improvement in every form—and they now behold with pride Kentucky marching forward to the highest rank among her sisters of the union.

A division of the work from Lexington to the seat of government, embracing nearly one third of the whole distance, and almost one half the whole cost, has been completed and is now in profitable use.—The business of that portion of the State through which it passes, is greatly benefitted by it; the prices of property of every description have been enhanced, and additional value has been given to labor.

The fullest demonstration of the utility of the work being thus presented, the President and Directors of the Company have resolved to resort to all the means attainable to finish the remainder of the line to the Ohio river in as short a period as practicable. With this view they now petition your honorable body for the patronage of the State. Recently a subscription to the stock of the company to the amount of two hundred thousand dollars has been made by the city of Louisville. According to the estimates of the engineers who have minutely examined the line, only four hundred thousand dollars, in addition to the Louisville subscription, will be required to finish the construction and furnish the necessary machinery. A State subscription will enable the Board of Directors to put the unfinished portion immediately under contract, and possibly, to complete it in the course of the ensuing year. An adequate investment on the part of the State will accomplish the noblest enterprize ever projected in this commonwealth, and realize all those public advantages which must flow from a speedy, certain and cheap intercourse between the fertile interior counties and our commercial emporium. The certainty of a dividend beyond what could be anticipated from a like investment in any other chartered company, can be easily shown. In the course of the past year, two semi-annual dividends have been declared by the Board of Directors of the nett profits resulting from the business of the road from Lexington to the head of the inclined plane near Frankfort, amounting to six and three-fourths per cent. on the capital paid in.—This being the result at the commencement, before well a adjusted system of economy and transportation had been devised, and while but an inconsiderable portion of the regular business of the section of country could, from the insufficiency of the machinery and motive power, be transacted, it is hazarding but little to assert, that no other work, when it shall be completed, promises to equal it in dividends.

The annexed statement from the Treasurer of the company will show the amount paid in by the stockholders, the cost of real estate, buildings and machinery, and the cost of the work as far as it has been completed.

The President and Directors would likewise respectfully petition your honorable body to pass a law amendatory of the charter in the following particulars, which experience has shown to be desirable and important to the interests of the company:

1. An additional charge of one and a half cents per 100 lbs. for transporting freight on the inclined plane at Frankfort—it being necessary to furnish extra power equal to this additional charge.

2. The exemption of baggage and small packages, conveyed with the passenger cars, and furniture and light bulky articles of freight from the rates specified in the charter—with authority to transport all such and other like articles, weighing less than 64 lbs. to the cubic foot, by special contract, as the charter now authorizes to be transported, silver and gold bullion, money and mails.

Authority to charge toll'age for the use of the bridge about to be erected across the Kentucky river at Frankfort.

And your petitioners will ever pray, &c.

THOMAS SMITH, President.
B. GRATZ,
J. BRAND,
E. WARFIELD,
B. W. DUDLEY,
W. H. RICHARDSON,
E. BAINBRIDGE,
C. HUNT,
L. STEPHENS,
R. HIGGINS,
J. GUTHRIE,
J BRUNE,
Directors.

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EXHIBIT OF THE AFFAIRS OF THE LEXINGTON AND OHIO RAILROAD COMPANY.

| | Dr. |
|---|---|
| To cost of road construction from Lexington to Frankfort, | $427,219 00 |
| To engineering expenses, including preliminary surveys, and mathematical instruments, | 30,733 61 |
| To damages for right of way, &c., | 11,261 93 |
| To real estate on the line, | 16,116 83 |
| To lots and buildings in Frankfort, | 6,296 00 |
| To lots and buildings in Lexington, | 6,216 00 |
| To bridges, | 5,988 81 |
| To office expenses, including salaries, printing, stationary, &c., | 11,110 77 |
| To amount of interest paid on money borrowed, after deducting premium on bonds sold, | 15,258 38 |
| To balance of cash on hand, 9th January, 1836, | 6,539 70 |
| | $536,737 93 |

| | Cr. |
|---|---|
| By this amount from stockholders, | $318,999 00 |
| By this sum from passenger account, after deducting expenses, | 9,200 00 |
| By this amount from freight transportation, after deducting expenses, | 2,669 08 |
| By bills payable, money borrowed on notes of the company, | 39,109 00 |
| By this amount from bonds of the company, guaranteed by the State, sold in New-York, | 108,000 00 |
| Real estate, | 16,116 83 |
| Lots and buildings, | 12,512 66 |
| Machine shop, | 14,600 00 |
| Cars, | 5,000 00 |
| Locomotive engine, | 7,000 00 |
| Horses, | 3,531 36 |
| | $536,737 93 |

A. O. NEWTON, Treasurer.
Lexington, Ky., Jan.'y 9, 1836.

No. 2.

LEXINGTON, Jan. 1, 1836.

JAMES T. MOREHEAD, Esq., Governor of Kentucky.

SIR:—In your message to the General Assembly, at the opening of their session, I observe that you say you have not had any report of the progress of the Lexington and Ohio Railroad Company.

Although I am not now the official organ of that company, I will endeavor to afford you the requisite information.

At the opening of the session of last year, the main stem of the road was extended to the top of the hill near Frankfort, but it was not finished, although the cars passed on it. When a single track is made, there requires much to be done, to fit it for operative use. Since then the company have done much to finish the work, and it may now be said to be finished thus far,

During the current year they have extended the road down the inclined plane and along Broadway at Frankfort, to the market-house. The main stem of the road has been finished for use, by several double tracks and turn-outs. Warehouses have been erected at Lexington and Frankfort, of a capacity to meet all the business of transportation and storage. A manufactory of machinery has been established at Lexington, where is made and repaired all kinds of cars and coaches, suitable for the road, and an ample stock of materials is provided, consisting of wood, iron and steel

Surveys of exploration have been made from the Kentucky river to Louisville, reviewing the former ones and exploring new routes, in the hope of improvement. The valley of Benson has been explored, and a way by Shelbyville, but found to be very broken and expensive, and attempts have been made to secure the right of way, which has not been entirely successful, but it is believed the right can be secured of what remains on such terms as will justify the making of the road to Louisville, and the Board has resolved to progress with the work next spring, to begin at Louisville.

The difficulties which heretofore existed with the city of Louisville, have been overcome, and that city has subscribed for two thousand shares of the stock.

Of the bonds guaranteed by the State the Board have sold $108,000; the balance of $12,000 has not yet been sold—the interest upon the bonds sold, has been regularly paid in New-York.

Of the business on that part of the road in use, I am not able to give a detailed account. But the demonstrations made this year, justifies the anticipations of the company, that when the road is extended to the Ohio river, the advantages to the country will be very great, and will ensure to the enterprising stockholders a reasonable profit on the money expended.

One especial advantage to neighborhoods through which the road passes, is a uniform enhancement in the value of real estate. This has been found already along the road, as it has been in the other States of the Union, as also in Europe. When the inhabitants are made duly sensible of these certain advantages to them, one may reasonably expect, that the objections now made by them to the passage of the road through their lands, will give way, and instead of opposition, encouragement may be expected to enterprizes of the like kind.

Respectfully, your obedient servant,

F. L. TURNER.

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To his Excellency, JAMES T. MOREHEAD:

SIR:—It is inferred from your Excellency's late annual message to the Legislature now in session, that a communication relative to the Lexington and Ohio Railroad, would not be unacceptable to you. I therefore submit the following report, touching the present condition and prospects of that work.

During the past year, the attention of the Board of Directors has been mainly directed—1st. To a further exploration and location of the line between Frankfort and Louisville—2d. To the completion of the Inclined Plane at Frankfort—3d. To the repairing and improving the road between Lexington and the Inclined Plane—4th. To the conveyance of the passengers and freight on the part of the work already in a state for use, and to the organization of a system of transportation—5th. To providing the requisite machinery and means of transportation on a scale suited to the wants of the public.

1st. With respect to the first object, I am happy to say that the differences of opinion which long existed between the Board of Directors and the municipal authorities of Louisville, and which have procrastinated the work, have been satisfactorily adjusted and that a subscription to the stock of the company on the part of that city, for two thousand shares, has been made. But other necessary preliminary arrangements could not be made in time to let any part of the work the present season on the south side of the Kentucky river. It is however confidently hoped that we shall be prepared early in the spring to contract for the grading, and in the course of the present year be able to complete no inconsiderable portion the work. With the cordial co-operation of the authorities and citizens of Louisville, deeply interested as they are in the enterprize, together with other aids which may be reasonably calculated upon, this company may now look forward to a speedy termination of their labors.

2d. The Inclined Plane descending the hill at Frankfort, from the peculiar character of the rock and earth through which the excavations have been made, has been found to be a work of more labor and expense than at first anticipated. Owing to unforeseen difficulties in the construction of this Plane, the extension of the road through the city of Frankfort, to the margin of the Kentucky river, could not be effected, much to the regret of the Board, in time to be used the present season. It was therefore thought best under the circumstances, to erect a suitable temporary depot at the foot of the Plane in the city. By the use of this depot, and the Plane which has been finished, a most vexatious interruption to business and travel will be avoided in future.

3d. The repairing of the road the past year required much labor. Experience has proved that stone sills are more liable than wood to be damaged by the action of the machinery used in transportation—and that when out of order the repairing is more expensive and tedious. Some of the embankments required enlarging, and the defects of one of the principal viaducts have been remedied. Business was consequently suspended in part for several weeks, but the daily trips of the passenger cars were regularly performed.

4th. Facilities to a considerable extent from the moment of opening the road to Frankfort, have been given to the trade and travel of this section of the State; yet the difficulties to be surmounted in organizing an entirely new and novel system of transportation, were found to be of no small magnitude. It was impossible to foresee at the commencement, the full extent of the various wants of the community. In the absence of experience, it could not be reasonably expected that a perfect system, adapted to every interest, should spring at once into existence. Time was necessary to test the plans adopted. Much improvement has been made and will continue to be made, with the view to render the work useful. But imperfect and unfinished as it is, I must be permitted to say, that great public accommodation has been afforded by it. The value and extent of that accomodation will be appreciated properly by those who enjoy the benefits of it at a season of the year when all unimproved highways are almost impassable. During the month of December, the number of passengers conveyed amounted to 1863, and the number of tons of freight to 272, exclusive of fuel and lumber. Our business enabled the Board of Directors in July last, to declare a dividend of 3¼ per cent., and on the 7th instant a second semi-annual dividend of two per cent, reserving a surplus.

5th. For the purpose of supplying the machinery indispensable to the transportation on the road, a machine shop under the direction of Mr. Charles B. Lewis, a machinist of rare talents, has been established, and is now in operation. A full supply of freight and passenger cars, the workmanship of our own mechanics, will soon be at the disposal of the company; these with two additional Locomotive Engines, which have been ordered with a view to substitute steam for horse power, and are expected to arrive early in the spring, will enable the company to meet all demands for transportation, and to demonstrate more fully the superiority of this mode of Internal Improvement over all others.

I will not trouble your excellency with further details of the business of a private corporation. Nor need I remind you that it has thus far been sustained and prosecuted almost exclusively by the public spirited citizens of a single interior town, although when completed, its benefits will be felt by the whole community. Already new impulses have been given by it to almost every branch of business; and with respect to other works of Internal Improvement recently commenced, it stands in high relation of a *first cause*. Why then should it not participate with those other works in favor of the Legislature, and share with

them the bounty of the State? While the work was deemed to be a visionary and impracticable project, the stockholders were content to rely upon their own resources to surmount prejudice, and opposition, and to prove its utility—looking forward to a season more auspicious to urge its claims to State patronage. The time has now arrived. One year's use of a portion of it, has demonstrated, that it will be productive of all the public good anticipated from it, and that the capital invested will give a good return of interest to the stockholders. In both respects the expectations of its original friends have been more than realized—for it was never imagined by them, that much profit could be derived from an interior division of a great work designed to subserve the general purposes of commerce in connection with navigation to all ports of the world; not that the local business of a neighborhood would be productive of as much public good relatively, as that which would flow from the use of the whole line.

In addition to the means in hand or available in the course of the year, it is estimated that the sum of four hundred thousand dollars will be required to complete the work to Louisville. Inasmuch as the Legislature seems to have adopted the policy of aiding with its subscriptions, as joint co partner, other chartered companies for the purposes of Internal Improvement, it is respectfully submitted whether any other work can present stronger claims to State patronage—whether the funds of the State can be more usefully or profitably invested than in the finishing of this road. In every point of view it is desirable that the connexion with the Ohio river at Louisville, as originally designed, should be accomplished speedily. With the aid of an adequate subscription on the part of the State, the work can be finished in the year 1837.—Without such aid it is apprehended that a much longer period must elapse before the accomplishment of that object. The question therefore is simply this,—whether the public interest would not be better promoted by a State subscription to hasten the completion of the Lexington and Ohio Railroad, than by permitting it to linger along upon individual patronage, while other public works of no great merit, to say the least, enjoy a monopoly of the State resources.

Another subject of some importance to the interest of the company, I beg leave to mention. The highest rate allowed by the charter to be charged for transporting freight is 3½ mills per mile for a hundred pounds. It is obvious that so low a rate will not cover the expenses of the extra power necessarily required at the Inclined Plane—to say nothing of the extra cost of construction, and the extra expense to keep it in order. It will not, therefore, be thought unreasonable to ask the Legislature to authorize a small additional charge for transportation in this part of the line, and also an additional charge for transporting bulky articles of light weight. The charter authorizes special contracts for transporting specie and mails. An extension of that privilege, so as to include furniture, feathers, wool, rags, and such like articles, will surely be considered just.

Relying upon the good will of your Excellency in behalf of those who are engaged in the most laudable efforts to advance the power and wealth of the State, and your willingness to present the claims of our work to the consideration of the Legislature,

I have the honor to be,
Very respectfully your
Obedient servaut,
THOMAS SMITH,
President L. & O. R. R. Co.
January 12, 1836.

## No. 3.

### AN ACT TO AMEND THE CHARTER OF THE LEXINGTON AND OHIO RAILROAD COMPANY. [PASSED 20TH FEBRUARY, 1836.]

SECTION 1. *Be it enacted by the General Assembly of the Commonwealth of Kentucky.* That the twentieth Section of an act to incorporate the Lexington and Ohio Railroad Company, approved January the twenty-seventh, one thousand eight hundred and thirty, be so amended as to authorize said Company to charge for transporting all single packages weighing less than one hundred pounds, twenty-five cents from Lexington to Frankfort, and all intermediate places, and at that rate if such packages weigh more than one hundred pounds, and when transported over any part of said road, the same rate may be charged according to the distance:—for transporting produce and merchandize, or property of any kind or description, at a rate not exceeding three and a half mills per mile; and for the transportation of passengers not exceeding five cents per mile for each passenger, with his baggage not exceeding forty pounds.

SEC. 2. That live stock, poultry, feathers, furniture, wood [wool] rags, and other light, bulky articles, also silver and gold bullion, money of all descriptions and mails be excepted from the rates of toll provided for in the first section of this act; and it may be lawful for said Company by their President and Directors, or a majority of them, or their agents, to contract especially for the transportation of such articles, and all others weighing less than sixty-five pounds to the square foot, upon such terms as the parties may agree upon.

SEC. 3. That the said Lexington and Ohio Railroad Company be, and they are hereby vested with all the rights and privileges, powers and liabilities, contained in an act of the General Assembly of this Commonwealth, entitled "an act to incorporate the Franklin Bridge Company."

SEC. 4. That it shall be lawful for the President and Directors of said Company to establish by their by-laws, rates of storage, and other fees or charges, for receiving, forwarding or storing such articles or packages as may be deposited in the warehouses, or with their agents for safe keeping.

SEC. 5. That it shall not be lawful for any person to ride on said Railroad or its embankments, or drive thereon any wagon, cart or other vehicle, or live stock, without the assent of said Company, their agents or servants; and any person offending herein shall be liable to be prosecuted before a Mayor of a city or a Justice of the Peace, and if a free person, fined any sum under five pounds, but not less than five dollars, and costs,—and if a slave, shall be punished by stripes not exceeding twenty, in the county where the offence shall be committed; but nothing herein contained shall prevent the offender from being prosecuted by indictment or presentment as provided for in the twenty-third section of the Charter of the Company, if they elect to do so.

SEC. 6. That the Legislature reserves to itself the right to repeal any amendment made by this act, to the Charter establishing the Lexington and Ohio Railroad Company.

JOHN L. HELM,
Speaker of the House of Representatives.
CYRUS WINGATE,
Speaker of the Senate.
Approved. February 20, 1836.

## No 4.

### EXTRACT FROM THE ACT "DEFINING THE POWERS AND DUTIES OF THE BOARD OF INTERNAL IMPROVEMENT, AND FOR OTHER PURPOSES."

APPROVED, February 29th, 1836.

"SECTION 28. That the said Board be, and are hereby authorized to subscribe for stock in the Lexington and Ohio Railroad Company, to the amount of two hundred thousand dollars.

The said two hundred thousand dollars in the Lexington and Ohio Railroad Company to be paid by the said Board in the same name and to the same amount, as the subscriptions by individuals or bodies corporate shall hereafter be paid."

### TABLE A.

Statement of the Revenue received for the transportation of passengers on the Lexington and Ohio Railroad from the 22 June 1835, to 13 May, 1836, and also of the balance to the credit of that account on the 22 June, 1835.

| | | | |
|---|---|---|---|
| 1835. | June, | this amount, | $996 02 |
| | July, | do. | 2423 56 |
| | August, | do. | 2285 05 |
| | September, | do. | 1741 80 |
| | October, | do. | 1734 33 |
| | November, | do. | 1654 05 |
| | December, | do. | 2242 74 |
| 1836. | January, | do. | 1815 22 |
| | February, | do. | 2556 57 |
| | March, | do. | 2199 85 |
| | April, | do. | 2255 91 |
| | May, | do. | 823 99 |
| | | | $22,529 09 |
| This amount to the credit of passenger account on the 22 June after deducting expenses, | | | $16,182 37 |
| | | | $32,711 46 |

A. O. NEWTON, Treasurer.
Lexington, Ky., May 13, 1836.

### TABLE B.

Statement of the Revenue received for the transportation of tonnage on the Lexington and Ohio Railroad, from the 22 June

1835 to the 13 May. 1836, and also of the balance to credit of that account on the 22 June, 1835.

| | | | |
|---|---|---|---|
| 1835. | June, | this amount, | $356 70 |
| | July, | do. | 886 20 |
| | August, | do. | 355 00 |
| | September, | do. | 141 97 |
| | October, | do. | 290 00 |
| | November, | do. | 325 00 |
| | December, | do. | 507 50 |
| 1836. | January, | do. | 503 02 |
| | February, | do. | 243 89 |
| | March, | do. | 560 58 |
| | April, | do. | 432 20 |
| | May, | do. | 200 00 |
| | | | $4,802 06 |

This amount to the credit of freight account on the 22 June, after deducting expenses, $2,055 50

This amount due to be collected for freight, $3,500 00

$10,357 56

A. O. NEWTON, Treasurer.

Lexington, May 13, 1836.

TABLE C.

Statement of the expenses incurred in working the Lexington and Ohio Railroad since 22 June 1835, to the 13 May, 1836.

| | |
|---|---|
| ITEM 1st. Expenses of Railway, including feed, shoeing and attendance on horses; also expense of Locomotive, salaries of agents and conductors, and the superintendant of transportation, | $16,551 47 |
| ITEM 2d. This amount paid for the repairs of Railway including salary of the superintending Engineer, | $3 672 17 |
| | $25,223 64 |

A. O. NEWTON, Treasurer.

Lexington, May 13, 1836.

TABLE D.

General Statement of the Receipts and expenses of the Lexington and Ohio Railroad, from the 22 June, 1835, to the 13 May, 1836, embracing the amounts disbursed for transportation, and for the maintenance and repairs of the Railway; also, the dividends paid to stockholders.

RECEIPTS.

| | |
|---|---|
| From passengers per table A, | $32,711 46 |
| From tonnage or transportation, | 10,357 56 |
| | $43,069 02 |

EXPENSES.

| | |
|---|---|
| Of transportation item 1st, per table C, | $16,551 47 |
| Repairs of Railway item 2d per table C, | 8,672 17 |
| | $25,223 64 |
| Dividend paid 1st July, 1835, | 12,711 00 |
| Ditto paid 1st January, 1836, | 2,893 52 |
| | 40,828 16 |
| Nett Revenue, | $2,240 86 |

A. O. NEWTON, Treasurer.

Lexington, May 13, 1836.

SECOND ANNUAL REPORT OF THE PRESIDENT AND DIRECTORS OF THE SANDY AND BEAVER CANAL COMPANY.

At a Meeting of the Stockholders of the Sandy and Beaver Canal Company, held at their office in New-Lisbon, Ohio, on the 10th day of August, 1836—

On motion of DAVID BEGGS, Esq.,

*Resolved*, That the Annual Reports of the Directors and Engineer be accepted and published, and that the thanks of the Stockholders be presented to the President and Directors for their strict attention to the interests of the Company.

*Resolved*, That the Stockholders, having the most entire confidence in the promptness, skill, and ability of the Chief Engineer. E. H. Gill, Esq., take this method of expressing their approbation of his course and direction of the work.

The following named gentlemen were elected Directors of the Company for the ensuing year:

BENJAMIN HANNA, *President.*

*Directors.*

| | |
|---|---|
| Elderkin Potter, | William Christmas, |
| Jesse Brown, | Timothy Abbott, |
| James Humbleton, | Lindsey Nicholson. |

Michael Arter, *Treasurer.*

Charles D. Hostetter, *Secretary.*

REPORT.

THE President and Directors of the Sandy and Beaver Canal Company, have the pleasure to present to the Stockholders their Second Annual Report.

In the last year, difficulties have been thrown in the path of the Board, with which they have had to contend, but which, happily, they have been enabled to surmount; and it is hoped that the Company is now placed in a situation, that nothing, other than physical obstacles, will impede their progress, until the final completion of the work.

An application was made at the last session of the Legislature of Ohio, for the power of borrowing money for the purpose of pressing onward more rapidly with the work on the Canal, as also to relieve the Stockholders from the rapid call made upon them by the Board to meet the demands of the Company; which application or request was deemed so reasonable in itself, that it was presumed no objection could or would be raised by an individual member; but to our great surprise, although every effort was made by the Senator from this district, as also the Senators from Stark and Tuscarawas counties, no amendment of the charter, in that particular, could be obtained.

At the last session of the Legislature, the office of Canal Commissioner was abolished, and a Board of Public Works created by law, and all the duties of those officers transferred to that Board; and we congratulate the stockholders of the Company, that the State has those agents to guard its public works who will dispense equal justice to all.

We now hope, and we have strong grounds to hope, that a bright day has dawned upon us. The loan of five hundred thousand dollars, which the Stockholders instructed the Board to obtain in March last, has been procured on terms, taking into consideration the money market, deemed favorable to the Company, by the Board, and by our Commissioners in Philadelphia. The transfer of stock, on the books of the Company, without the formality required in the transfer of real estate, by an act of the Legislature of Ohio, as also of Pennsylvania, has been obtained; and that provisions in our charter, requiring such formality, so objectionable to the holders of stock, has been repealed. And we would here remark, that for this amendment, as also for their other efforts in our favor, we owe much to those members of the Legislature residing in the immediate vicinity of the line of the Canal: to name individuals would be invidious—all used their best efforts in our favor, and all are entitled to the thanks of the Stockholders, for their exertions in behalf of the Company. Another important step has been taken for the interest of the Company: the Board of Public Works, in pursuance of a resolution of the Legislature of the State, have ordered a survey of a Canal or Railroad line, from the terminating point of the Sandy and Beaver Canal, on the Ohio Canal, at Bolivar, to the mouth of the Auglaize, the connecting point of the Miami and Wabash and Erie Canals. An Engineer has been detailed for the service, and is now engaged in the survey. From the known character of the country, no doubt can be entertained that a favorable report will be made; and it is equally certain that, if the proper efforts are made by those immediately interested, this work must and will be accomplished, either by Legislative aid or individual enterprise.

The Michigan and Illinois Canal, destined to connect Lake Michigan with the Mississippi, by the Illinois river, is, or will be, placed under contract the present season, as also a canal from the Wabash and Erie Canal, to connect with the Michigan and Illinois Canal, at the outlet of Grass-Lake.* Let, then, this contemplated im-

*The authority for this statement is a Letter from a gentleman in the State of Illinois, to the Editor of the "Ohio da Whig," dated May 16, 1836.

"We have information from sources, of the correctness of which no doubt can be entertained, that the State of Illinois has in contemplation and under contract 446 miles of canal and railroad: The State of Indiana has 1700 miles of canal and railroad in contemplation, and 200 miles of canal and railroad under contract, or to be placed under contract the present season; and that State at the last session of their Legislature, appropriated eight millions of dollars for internal improvements: The State of Kentucky has in contemplation or under contract, 300 miles of canal and railroad: Michigan has 300 miles of canal and railroad in contemplation or under contract; and the State of Ohio has 400 miles of canal completed, and 1200 miles of canal and railroad in contemplation or under contract. And from the character of the country and the importance of the works to the several States interested, no doubt can be entertained that the larger portion of those works will be *made*, and when *made*, will connect with each other."

We will state one other fact, showing the importance of the connection from Bolivar to the Wabash and Erie Canal, at the mouth of the Auglaize: a railroad is in contemplation or under contract, from the Wabash river, from the termination of the Wabash and Erie Canal, to LeGrange, on the Mississippi, 500 miles above the mouth of the Ohio. From that point, following the Mississippi and Ohio to Pittsburg, and from thence to Philadelphia, by the Pennsylvania Canal and Railroad, cannot be less than 1900 miles. From the same point, by railroad and canal and the contemplated improvement, from the mouth of the Auglaize river to Bolivar, from thence by the Sandy and Beaver Canal to Pittsburg, and from thence by the Pennsylvania Canal and Rail-

road to Philadelphia, the distance cannot provement, from Boliver to the mouth of the Augla ze, a distance not exceeding 150 miles be completed, and you open, by works now made and making, a direct communication, by Canal and Railroad, of more than 1000 miles in extent, from the city of Philadelph a, through the interior of Ohio, Indiana, and Illinois, to the southern extremity of Lake Michigan, and to the Mississippi, at the mouth of the Illinois river. Can any one doubt that this remaining work, connecting the Sandy and Beaver Canal with the Miami and Wabash and Erie Canals, will remain long unaccomplished? If he doubts, he is unacquainted with the spirit of the times and the age in which he lives. Complete this work, and you open a direct communication, through a country unsurpassed in the richness of its soil, and which is now rapidly changing by the hands of the settler; a country destined to become the granary of the Atlantic States and of Europe. Complete this work, and Philadelphia can say, that, by *her enterprize* and *her wealth*, aided by the munificence of the States interested, a work has been accomplished, of far greater importance than any of the boasted canals of Europe, or the far-famed works of Asia; and that, seated on the borders of the Atlantic, her arms are extended for the purposes of commerce, the arts, and the wants of civilized life, to the base of the Rocky Mountains, on the one hand, and to the regions of frost and snow, at the head of the Mississippi, and the great Lakes of the "far West" on the other. We make no apology for dwelling thus long upon this subject—it is so vast and so important to the interests of our common country, as also of much vital importance to the interests of this Company, it needs none. And we cannot withhold the meed of praise to our principal Engineer, for lying broad and deep, upon the waters of the Sandy and Beaver Canal, the foundation of an extensive and extending commerce; believing, as we do, that the time will arrive, when that commerce will be only limited by the capacity of a work, affording the greatest facilities, and of enlarged diminsions.*

To estimate the value of this work or the value of the stock, we deem unnecessary: the value of the stock must be rated, at a day not distant, by the liberality of the charter alone.

The Report of the Engineer, which accompanies this paper, gives a clear and definite expose of the progress of the work for the year past; and any additional remarks from us would be superfluous; yet we cannot refrain from observing, that much credit is due to him and his assistants, for their attention to every part of the work: the greatest caution has been used to procure the most durable materials, as well as the best hydraulic cement, and so far as we are competent to form an opinion, the stone work, so important to works of this character, is of the most stable kind, and will favorably compare with any work, now completed or in progress, in the United States.

The completion of this work, we believe, will be protracted beyond the period first contemplated, owing to the difficulty of procuring laborers, occasioned by the multiplicity of public works now on hand in the United States, a part of which are in our immediate vicinity; to what extent we cannot now say, as the cause may operate more or less favorably in future.

The amount already expended and due by the Company on the work, as appears by the Report of the Engineer, is $481,723 09. The amount paid for real estate is $48,621 18. The money thus invested, including interest, it is confidently believed, will be more than refunded to the Company, after the Canal is completed, the Company retaining only those portions that are important to the Canal and the works connected therewith.

By order of the Board,

BENJAMIN HANNA, President.

CANAL OFFICE, NEW-LISBON, Ohio.
August 10th, 1836.

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exceed 1100 miles, making a difference in favor of the last named route of 800 miles.

*In a Buffalo paper it is stated, that in *one day* in the month of July last, 15 000 barrels of Ohio flour were landed on, the wharves of that city.

ENGINEER'S REPORT.

*To the President and Directors of the Sandy and Beaver Canal Company.*

GENTLEMEN,—I have the honor to lay before you the following Report, exhibiting the present condition of the work under my direction.

The construction of the canal during the interval which has elapsed since my last Report, has been steadily advancing, but not with as much activity and energy as I anticipated Indeed, the unexampled demand for mechanics and laborers, and the very great increase in the price of provisions, owing to the large amount of public work in progress in various portions of the country, rendered it almost impossible for the contractors to place sufficient force on their jobs to complete them by the stipulated period, without paying prices far above what their contract prices would justify; and to have urged such a measure would have proved ruinous to them, and caused the Company to sustain a heavy loss, as the work under existing circumstances could not be re let without an advance of at least twenty-five per cent. on the original prices. Notwithstanding these obstacles, a large amount of work has been done. But little more than a year has transpired since active operations were commenced on the line, and in that short period, as will be seen by the annexed tabular statements,* one dam and the masonry of 11 locks have been completed, in addition to which, 7000 perches of masonry for dams and locks have been laid, 15,843 perches of stone, 270,600 linear feet of timber, and 248,200 feet of plank delivered. Equal to 62 sections or 31 miles of canal and towing-path along the pools are finished, involving the excavation of 1,482,551 cubic yards of earth, 146,856 cubic yards of rock and slate, and the formation of 472,838 cubic yards of embankment, together with 35,002 cubic yards of rip rap wall, and 5303 perches of slope wall

Nearly all the heavy sections on the line, to complete which would require more than an ordinary period of time, are now under contract and in a state of forwardness.—The reservoir mound on Cold Run will be completed in a few days; the West fork reservoir mound, early next season. The deep cut at the western end of the tunnel, a work of some magnitude, comprising sections number 5½, 6, 6½, 7, 7½ and 8, of the Middle Division, has been prosecuted with energy by the contractors, Messrs. Stewart & Mears, 330,000 cubic yards of excavation having been removed by them during the last twelve months; those sections will be completed next season.

*In possession of the Agent at the Bank of Pennsylvania.

The tunnel and eastern deep cut were relet in February last, to Messrs. Young & Carmichael, contractors of known energy and perseverance. They have obligated themselves to have the work finished by the 15th of October, 1837. Two large working shafts have been sunk, and openings formed in the drift; the material to be excavated, is a sandstone of remarkably fine texture, easily removed, and sufficiently permanent to stand without arching. The excavation of sections number 15 and 16, Middle Division, (heavy sections,) has progressed with spirit. About ten feet above the level of canal bottom, a horizontal vein of very excellent bituminous coal twenty inches in thickness has been discovered, and immediately under it is a strata of hydraulic limestone, two feet in thickness; the latter is now being used in the construction of masonry on the line.

The embankment across the Tuscarawas valley, on the Western Division, commenced in November last by James Giddings, contractor, is now nearly completed. The various locks and dams under contract, are all in a state of forwardness, and I am fully of opinion that by the close of the present season, upwards of 30 locks, 9 dams, and 72 sections, or 36 miles of canal and towing path will be completed. The force at present employed on the line, is equal to 2000 men, and at no period during the last twelve months has it been less than 1500.

The masonry of the locks thus far constructed, is generally of a superior character. Locks number 28, 29, 30, 31, 32 and 33, erected by Messrs. Rankin, Char ers & Co., are well and faithfully built; likewise 41 and 42 by Loring, Lush & Co.; and 49 by Kinnimont & Stewart, all are fine specimens of hydraulic masonry.

In the vicinity of the summit, where an economical use of water is desirable, I have adopted a new plan for the upper gates of the locks. The gate is similar to those used in the weigh locks, and is intended, when open, to rest or lie flat on the lock floor; and to be raised for the purpose of closing by means of a chain and ratchet wheel. This gate I am of opinion, will prove more durable, and less expensive, than the ordinary one.

The Eastern Division of the line is now under the superintendence of Charles A. Olmsted, assistant engineer, aided by James Bradley, sub-assistant, and Augustus Howe, target bearer. The Middle Division, and the first fifteen sections of the Western, are under the direction of Joshua Malin, assisted by Roger Moreledge and Washington Gill, as sub-assistants, and John M. Hamilton and Lot Dixon, target bearers; and the western fifteen miles of Western Division, are under the charge of J. B. Conard, aided by W. R. Harrison, sub-assistant, and Pliny Hoagland, target bearer. The mason work is under the superintendence of William Huntsman and Walter Scott, and the carpenter work under the charge of Daniel Smith. The various duties assigned these gentlemen, have been performed with promptness and fidelity, and much to my satisfaction.

Recent examinations along the West fork of Little Beaver Creek on the Middle Division, between sections numbers 18 and 22, have induced me to make an alteration in the location of the line there. The banks of the streams are high and precipitous.—The line was formerly traced along the western bank; the bottom of the canal being elevated from ten to thirty feet above the base of the bluff or valley of the stream, thereby causing a very heavy, expensive, insecure and leaky embankment; and as

those bluffs in most instances are formed of a material unfit for the formation of a canal embankment, it became absolutely necessary for the safety of the work that a change in the plan should be made; but one alternative presented itself, and that has been adopted; the erection of a high but short dam or mound across the valley of the stream, near the upper extremity of section No. 18, at the Hanover Road, and substitute "slack water" for canal from that to a point at or near section No. 22, where a second mound of much less magnitude is to be erected to prevent the pond from inundating the town of Gillford, and the low ground in its vicinity; the water that may collect between the latter mound and Gillford, is to be conducted into Cold Run by means of a ditch or drain terminating at Bowman's mill pond. This change in the location it is believed, will render permanent and secure the only portion of the Middle Division that was not before so, save the Company fifteen thousand dollars, and add largely to the supply of water on the summit.—The ground that will be inundated, amounts to 140 acres, nearly all of which is now in possession of the Company. It is contemplated to use one foot in depth of that surface for a reservoir which will contain 6,098,400 cubic feet of water. The inhabitants of Gillford, are somewhat dissatisfied with the alteration; they are fearful it will subject them to sickness; their fears are presumed to be perfectly groundless inasmuch as the pond will be one half mile distant from them; its banks or shores nearly vertical; the water from eight to forty feet in depth, and its surface narrow.

A reconnoisance for a continuation of the line to Beavertown, under the provisions of the amended charter granted by the Legislature of Pennsylvania, has recently been made; but other duties of a more important nature have prevented my making a detailed report and estimate of the probable cost of the route; sufficient has been done, however, to warrant me in stating, that no obstacles of a serious nature will be encountered, and that the canal can be constructed at an expense not exceeding one hundred and ninety thousand dollars more than it would cost to terminate it at the debouch of Little Beaver Creek. It may not be improper here to remark, that the amended charter from the State of Pennsylvania, is not of as liberal a character as the importance of the work should have dictated, nor such a one as might have been anticipated from that enlightened State.

The Sandy and Beaver Canal, by all conversant with the internal improvements of our country, must be viewed as a continuation of the great chain of improvements already completed in Pennsylvania, or as a link connecting it with the various improvements of the far West, extending to the rich and fertile Valley of the Mississippi River, which must ultimately tend to enrich the coffers of that State, and add immensely to the business and prosperity of its metropolis. Viewed in this light, the work is one that well deserves the fostering care of the State of Pennsylvania.

All which is respectfully submitted.

E. H. Gill, C. Engineer.

New-Lisbon, Ohio, August 8, 1833.

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From the Petersburg Intelligencer.

RAILROAD MEETING.

At a meeting of the citizens of Petersburg, convened at the Court House on the 1st October, 1836.

James Macfarland Jr. was appointed Chairman, and Samuel Mordecai, Secretary.

The Chairman stated to the meeting that the object for which it was convened, was to consider the policy of constructing a railroad from Petersburg in a south-westerly direction, and if approved, to recommend it to our fellow citizens generally.

After a few remarks from several members of the meeting John D. Townes, Esq, offered the following resolutions, which were unanimously adopted.

1. *Resolved*, That this meeting approve the general plan and objects of the proposed railway from Petersburg to the south-western part of Virginia, between the waters of the Roanoke and Appomattox, and deem the work likely to promote the general interests of a large portion of Virginia, and to prove a profitable investment of capital.

2. *Resolved*, That feeling assured of the superior advantages of a route south of the Appomattox, for the transportation of commodities to and from both Richmond and ship navigation on James river, as well as to and from Petersburg—and thus offering a choice of markets and of channels of trade;—we invite the attention of the people of the producing region of country to this, and to other routes which have been proposed—and ask merely that they will aid in constructing a railway on that route which may promise upon full examination to be the most useful and profitable.

3. *Resolved*, That, in testimony of our confidence in the value of the proposed work, we recommend to the Common Hall of Petersburg, the consideration of the propriety of making a liberal subscription on the part of the town.

4. *Resolved*, As the best means of securing confidence in the proposed work, and of obtaining its speedy accomplishment, it is expedient to commence forthwith a preliminary and conditional individual subscription, to be made certain if the report of the survey of the route shall be favorable, and a charter be obtained at the next session of the Legislature, and its provisions be approved by as many persons as shall have subscribed for a majority of the shares of stock thus taken.

5. *Resolved*, That a committee of five be appointed to solicit and receive the signatures of individual subscribers in this town, and to correspond with any other committees, or individuals, in the counties and towns on and near the line of the proposed improvement, for the purpose of furthering the general objects in view.

6. *Resolved*, That the Mayor be requested to lay these proceedings before the Common Hall of Petersburg, and to ask, in the name of this meeting, the early consideration and action of that body.

7. *Resolved*, That the proposed improvements of the Roanoke, and those of the Upper Appomattox now in progress, will be highly important to the trade and prosperity of Petersburg, and will deserve all the support and aid that the influence of this town can give.

8. *Resolved*, That we fully approve of so much of the recomendationn of the Convention lately held in Charlotte, as proposes a railway from Danville to Farmville.

The chairman appointed the following gentlemen the committee, under the 5th resolution, viz. J. D. Townes, C F. Osborne, Edmund Ruffin, J. Y. Stockdell, and P. C. Spencer.

*Resolved* That the Editors of the newspapers in Petersburg, Richmond, Lynchburg, Danville and Farmville, be requeste to publish these proceedings.

James Macfarland, Jr., Chairman.
Samuel Mordecai, Secretary.

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Central Railroad.—The Macon Messenger of Thursday last, says: "The Survey for this route commenced at this place on Thursday last, by Mr. Reynolds the Assistant Engineer, and our fellow citizen Richard W. Ellis. From the knowledge Mr. E possesses of the country his services will be valuable.

Mr. Reynolds has been from infancy a resident of this State, and ranks among the first Engineers in the country.

The route from this city is by a very direct course to Harden's Mills on Stone Creek—thence up that creek a short distance to the lowest point in the dividing ridge of the waters of the Ocmulgee and Oconee, thence down Big Sandy Creek to the Oconee at or near the month of Buck Eye, in Washington county.

The principal Engineer, Judge Randall will commence a survey in a few days at Savannah and meet Mr. Reynolds about the middle of the route."

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The Railroad.—We have the satisfaction to announce that on Wednesday last, the brig Algerine, Capt. Gorham, arrived here from New-York with one hundred and thirty laborers for the Railroad. This important work has proceeded as rapidly as could be expected. Its progress towards completion would, however, have been much more rapid but for the difficulty of procuring hands This difficulty is not yet removed. We understand that three or four hundred laborers are still wanted.

Contracts have been made for the excavation and embankments required on the first fifty miles of the road, and the contractors are now at work upon it.

The Brigade of Engineers under Major Graham, after having, as we understand, completed the final survey and location of the road to Brooklyn, or to some point near that place, suspended their labors for a few weeks, about the 25th of August. Towards the close of this month they will resume their examination of the route, and locate the road to Columbus.

It was the very anxious desire of the President and Directors of the Company to employ slave labor upon this work, but such is the present demand for slaves for plantation purposes, that it has been found impossible to hire blacks in any sufficient number.

It will be gratifying to the public to know that the order of the Company for the iron railing, sent to Liverpool, as mentioned in a former number of our paper, arrived just before the extraordinary rise in the price of that article had taken place. The contract was made without loss of time, and a vast saving will thus accrue to the Company.

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Railroads in Cattaraugus.—A facetious Buckeye, Ohioite says, that the system of travel through the cattaraugus woods is for every passenger to go on foot near the stage, to be ready to relieve the vehicle from any accident, on account of the deep holes and ruts in the road. This was borne quite

cheerfully, no alternative being nigh. At last, emboldened by success, the agent insisted that each passenger should carry a rail, to pry the coach out of the mud. Some good natured persons consented; but one man declined. 'Look here,' said he to the agent, 'I have paid for a passage in your stage, and I'll go on foot to oblige you, but I won't carry a rail.'

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Long Island Railroad.—We understand that the Directors of the Company have expressed the unanimous opinion that it is desirable to complete the branch to Hempstead this fall. They have lately imported a quantity of railroad iron, and intend to lay the rails upon the portion of the road already graded till they come to a point opposite Hempstead, when the road will be made at the same time toward Hempstead and Jericho.

The company and the people of Long Island feel it to be equally desirable to have a portion of the road put in use as soon as possible.—[L. I. Starr.]

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In this day of improvement, it is shameful that so dreadful an accident as the one detailed below, should occur on a road having the benefit at least of the experience of some years.

We have seen cars and plans of cars designed to prevent any such accident. A short-sighted economy should not retard their introduction to general use.

SHOCKING RAILROAD ACCIDENT.

The following account of a most painful accident on the Columbia Railroad was left at our office by a friend, who it will be seen was a witness of the painful scene which he describes:

Fairview, Sunday, about 3 o'clock.

This afternoon, as the train for Lancaster was approaching Fairview, the axle of the forward car, or car next to the baggage, broke, which immediately precipitated the body of the car upon the railway, the fragments of the axle ripping up the bottom of the car in which was a Mr. Gibson of Philadelphia, bound to Cincinnati with his wife and children. His wife and child fell through, and nearly the whole train passed over her body.

I cannot picture to you the heart-rending scene that ensued when Mr. Gibson was called to the spot where his wife lay a mangled corpse, with the child, about 18 months old, by her side, covered with the blood of its dead mother. The top of her head was cut off, and the brains lay on both sides of the rail; the body, feet, arms and legs broken to atoms Heavens! what a sight! the distracted man tenderly dragging from the spot the remains of his 'Julia,' calling upon her in frantic exclamations; but she could only answer by an expiring look of agony. He next picked up his babe, and believing it too was dead, ran around among the crowd imploring assistance, when it was impossible to afford him the least consolation. The child was miraculously preserved. I was next called to witness another scene which beggars description.

A black man, who had vainly attempted to leap from the car when the accident took place, fell upon the ground, and the car running off the track upon the side he jumped, the wheels passed over both his legs and cut them off in the most shocking manner, grinding the dirt and clothing into the mangled flesh. He lay writhing in the most excruciating agony, under the body of one of the cars, until enough of assistance could be rendered to raise the car off him. He will not, it is believed, survive.

A gentleman in the forward car had his left arm broken, and breast much injured, but it is possible he will recover.

The train was propelled at the rate of 15 to 18 miles per hour at the time of the accident, and ran not more than the length of the train or 50 yards, ere it brought up.

I was with my family in the next car to the one which Mr. Gibson was in, and the fragments over which we passed, tore up the bottom without injury to any of its passengers. It was a miracle that we escaped—one of our wheels was spokeless, nothing but the naked rim left to give assurance it ever was a railroad wheel. Even the rails, for a considerable distance, were torn from their fastenings, and some broken.

This seems to be one of those accidents against which it is difficult to guard unless by some new arrangement of the wheels and axles of the cars, or perhaps by a thicker flooring to the cars.

It is mentioned that the engine and one car was immediately dispatched for Lancaster city for medical or surgical aid for the sufferers, and that before it returned the cars were set in motion.

In the hope of conveying the wounded towards medical aid, they had gone to a short turn, when the locomotive came sweeping round, and was not checked until it came in contact with the cars, and did considerable injury.—[United States Gazette]

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From the Journal of the Franklin Institute.

NOTE ON THE OCCURRENCE OF BITUMINOUS COAL NEAR THE CITY OF HAVANA, IN CUBA; BY R. C. TAYLOR, MINING ENGINEER.

TO THE COMMITTEE ON PUBLICATIONS.

Gentlemen—I observe with much interest the notice of your correspondent, in the last number of the Journal of the Franklin Institute (p. 375.) of a plan for extensively working the beds of bituminous coal in Illinois. There is little doubt but that an abundant supply of coal, of the quality he describes, will be of great public utility in the South—will supersede, for many purposes, the employment of other fuel;—and will have a widely extended market, even down to New-Orleans, to the great private advantage also, I trust, of those who are preparing to put this undertaking in execution.

I do not think, however, that the Illinois coal will form a large article of export, to the Havana for instance, as your correspondent suggest. *The existence of extensive veins of coal within the tropics is now established.* Probably it is not yet generally known, that there have been recent discoveries of coal, of very extraordinary quality, at least two points on the coast of Cuba, near the Havana. One of these is only three leagues from that city, and two miles from the sea at a place of embarkation. This mine has very recently been investigated by Mr. Clemson and myself, and forms the subject of a joint report to the proprietors, on the quality, quantity, and mode of working it efficiently.

I do not enter into a description of this singular coal, because we are preparing a separate communication for a scientific institution.

It is extremely probable that this coal which contains so remarkable a proportion of bitumen, will be exported from the Havana to most of the ports of the southern extremity of this continent.

I may add that coal occurs near the north-east end of Jamaica. Mr. De la Beche informs me, however, that these coal seams are very thin, and that none of sufficient magnitude to render them worth working have been discovered.

I am, gentlemen, respectfully,
Richard O. Taylor.
Philadelphia, July 13, 1836.

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After the most costly and prolonged contest in the two Houses, upwards of 80 days in Committees, Stephenson's line of railway between London and Brighton has followed the fate of Rennie's, Cundy's, and Gibbs's, and was thrown out yesterday afternoon in the Lords' Committee, by a majority of 17 to 8 Peers. The resolution which disposed of it was as follows:—"That it is inexpedient to proceed further with this Bill during the present Session." The minority was—Richmond, Ducie, Portland, Strafford, Queensberry, Glengall, Beaufort, and Westmoreland. The majority—Verulam, Cumberland, Warwick, Bayning, Monson, Mountford, Wynford, Redesdale, Lake, Strangford, De Lisle, Abingdon, Gage, Clanricarde, Teynham, Exmouth, and Berwick. Two only of the minority and four of the majority voted without hearing the discussion or evidence. The decision there, so far as regards attendance, was *bond fide*. The principal reasons for rejecton were the decided objection of the great majority of the inhabitants of Brighton to Stephenson's line, and appearance in the Lords' Committee of the Brighton Junction Railway, a line uniting Brighton with the London and Dover (south-eastern) at Hoxted, a cutting of not more than thirty miles. The announcement of the result at the Stock Exchange was received with three loud cheers. Brighton will have to wait another year for railway connection with the metropolis.—The contest is reputed to have cost upwards of £100,000, and to have been remarkably profitable to the legal profession.—[Chronicle.]

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Poisonous Principle of Hemlock.—The principle of the Hemlock plant, which is fatal to life is, according to Professor Geiger of Heidelburg, a kind of alkali, in the shape, however, of an oily fluid. It is easily obtained by distillation. At a moderate temperature it neutralises acids without forming crystalizable salts: it contains a considerable quantity of azote, and when exposed to the air is rapidly decomposed, giving out ammonia. Professor Christison, of Edinburg, has repeated the experiment of the German chemist, and found them alike in their results. In activity this new poison hardly yields to prussic acid.—Two drops applied to a wound, or the eye of a dog, hare, or cat, bringing death in nine seconds, and the same quantity injected in the form of muriate in the formal vein of a dog kills him in three seconds at the utmost.

From the Journal of the Franklin Institute

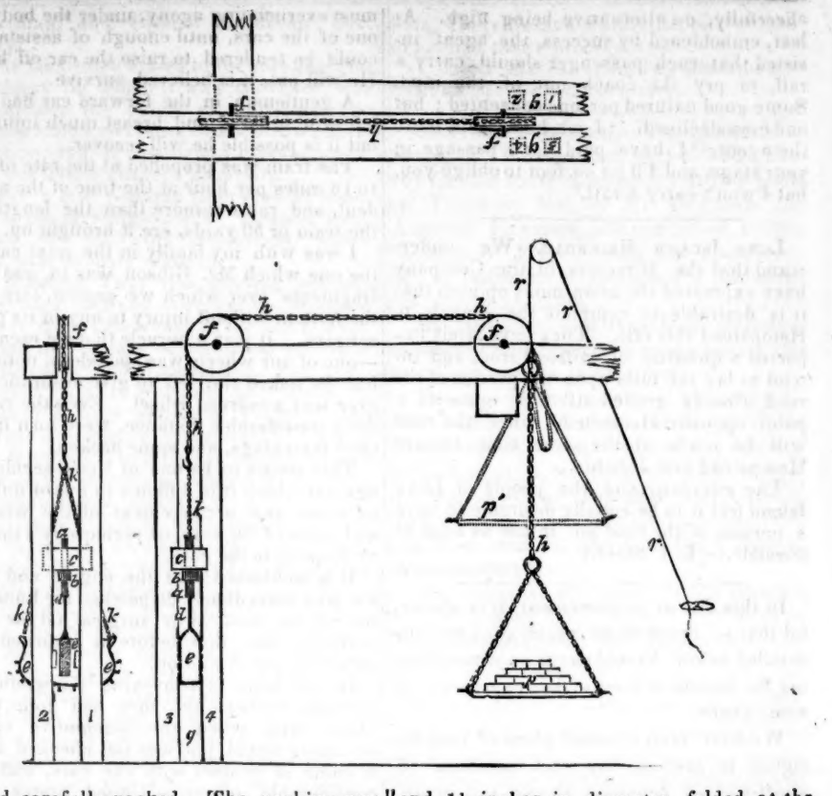
## EXPERIMENTS ON THE RESISTANCE OF SAND TO MOTION THROUGH TUBES, WITH ESPECIAL REFRENCE TO ITS USE IN THE BLASTING OF ROCKS, MADE AT FORT ADAMS, NEWPORT HARBOR, UNDER THE DIRECTION OF COL. TOTTEN.—BY LIEUT. T. S. BROWN, OF THE CORPS OF ENGINEERS.

For the purpose of examining further the degree and nature of the resistance offered by sand when it is attempted to force it through a tube by direct pressure. the following apparatus was arranged, after a a few preliminary trials, which had given some idea of the power it would be necessary to apply. A side and end view, and a plan of the apparatus are given in the cut on the next page.

The strong cast composition tube, *a*, about fifteen inches in length, which contained the sand, was held in a vertical position by being passed through the block, *c*.—The pressure was always applied to the bottom, and the collar, *b*, cast upon the tube, prevented its being forced upwards. The block *c*, was secured in its place by being let into the four posts, 1, 2, 3, 4, passing from the floor to the ceiling. These four posts formed a very stable frame work, and between each pair, the space, *g*, permitted the sliding board, *e*, to move freely up and down, and secured the proper direction to the pressing force. For the sake of distinctness this space, *g*, has been represented wider on the sketch, and the sliding board, *e*, thicker, than they actually were. The pressure was applied by means of a moveable piston within the tube, connected by means of the iron rod, *d*, with the sliding board, *e*. This sliding board was attached, by means of the chains, *k*, *k*, *h*, *h*, *h*, passing over the cast iron pullies, *f*, *f*, to the platform, *p*. Of course any weight placed on this platform communicated a corresponding pressure upwards to the piston within the tube. The chain *h*, *h*, was of the best Peru iron;* the wire was about ½ an inch in diameter, and the chain had been proved with 9 tons dead weight. The pullevs, *f*, *f*, were about a foot in diameter; and their axles were of wrought iron an inch and a half in diameter. When a dead weight was to be applied, the platform was loaded in the position, *p*, but if a violent shock was to be produced, the platform was held in the position, *p'*, by means of the cord, *r*, *r*, *r*, until it had received the proposed load; the cord, *r*, *r*, *r*, being then suddenly cast loose, permitted the loaded platform to fall freely by its gravity, until it had straightened the chain. when it was either entirely arrested by the resistance of the sand in the tube, or it forced its way to the floor in consequence of the yielding of the sand, or of the fracture of some part of the apparatus.

There were other minor details which it is not necessary to particularize. The fixtures were not brought to the degree of strength just stated until after many trials, and the repeated failure of nearly every part of the apparatus; and, as will be seen, a limit was soon attained, beyond which the experiments, even with this degree of strength, could not be carried. The weights used were bricks. The piston was so arranged as to move without friction when the tube was empty, and at the same time to prevent the escape of the sand when the tube was charged. Trials were made with sand poured loosely into the tube, and with

* Peru, Clinton county, New-York. The iron from this locality possesses a remarkable degree of tenacity.



sand carefully packed. The packing was performed by means of a sharp stick which was worked up and down in the sand as it was slowly poured in. This method was found to be the best, and is the one always used at Fort Adams, in charging drill holes for sand blasting. The sand used was dry and free from dust, and from all particles which would not pass through a hole $\frac{1}{14}$th of an inch in diameter.

A preliminary series of experiments was tried, the results of which will not be given, as they were all subsequently repeated in a more careful and accurate manner.

In the second series, a tube of tin, fifteen inches long, having an interior diameter of 1¼ inches was used instead of the cast composition tube, *a*, above described, and a 3½ inch bolt-rope instead of the chain, *h*, *h*, *h*. The following table indicates a portion of the results obtained.

TABLE I.

| No. of the experiment. | Number inches of sand in the tube — Packed. | Number inches of sand in the tube. — Unpacked | Weight which it was necessary to place on the platform in order to force the sand from the tube. | REMARKS. |
|---|---|---|---|---|
| | Inches. | Inches. | Pounds. | |
| 36 | | 2 | 310 | |
| 37 | 2 | | 950 | |
| 38 | | 3 | 200 | |
| 39 | 3 | | 360 | |
| 40 | 3 | | 760 | |
| 41 | | 4 | 2166 | |
| 42 | 4 | | 2540 | |
| 43 | 4 | | | Experiment lost. |
| 44 | 4 | | 2150 | |
| 45 | 5 | | | With 2100 lbs. the piston was not moved. |
| 46 | 9 | | | With 1900 lbs. the piston was not moved. |

*Observations on Table I.*—The tube was of the kind called double tin, 15 inches long, and 1¼ inches in diameter, folded at the seam, and strongly soldered. The piston was just inserted into the bottom of the tube, and the weights given in the fourth column, were those which were necessary to force it quite through the tube, with the sand before it. In the experiment No. 46, where 9 inches of packed sand were tried, after a weight of 1900 pounds had been placed on the platform, without producing any effect, an effort was made to drive the sand from the tube by forcing up the sliding board, *e*, with a lever. In this operation the tube was bent, and split at the soldering, but the sand was not forced out. It was soon ascertained that very great weights would have to be used when the depth of the sand was equal to, or greater than four times the diameter of the tube, and that the process would be tedious; it was accordingly resolved to abandon the use of dead weights, and employ the momentum of falling bodies. Previously to making these trials, a glass tube ⅜ths of an inch in diameter, was procured and experimented upon. It admitted six inches of sand to be forced out of it, but with 8 inches of sand well packed, it burst when the dead weight of 550 pounds was applied.

*Observations on Table II*—The tube and rope were the same as described in observations on table I. The experiment No. 61, the top of the sand was made even with the top of the tube before the experiment was begun, by pushing up the piston until only so much space was left above it, as it was intended the sand should occupy. This rule was observed in all the subsequent experiments. This table shows that it required a weight of 1320 pounds, falling 3 feet, to force 5 inches of dry sand out of a tube 1¼ inches in diameter, and 1630 pounds, falling 3 feet 5 inches, to force out 6 inches of sand. Experiments, 60, 61, 62, and 63, showed that the apparatus in its then state could not sustain the force necessary to expel 7 inches of sand, and accordingly these experiments were suspended until a cast brass tube could be procured, and an iron chain be

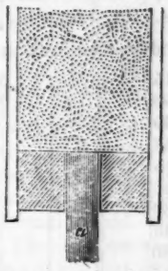
TABLE II.

| No. of the experiment. | No. of inches of sand in the tube. Packed. | Weight with which the platform was loaded. | Distance through which the platform will fall with the foregoing weight. | | Distance through which the piston was forced by the foregoing power. | REMARKS. |
|---|---|---|---|---|---|---|
| | inches. | pounds. | feet. | inches. | | |
| 47 | 5 | 920 | | 10 | none. | In these experiments the rope stretched so as to permit the platform to touch the floor before producing the full effect. |
| 48 | " | 1120 | 2 | 0 | do. | |
| 49 | " | 1320 | 2 | " | do. | |
| 50 | " | 1320 | 3 | " | thro' the tube | |
| 51 | 6 | 1320 | 3 | " | none. | Trial defective. |
| 52 | " | 1630 | 3 | " | none. | The rope was broken, trial defective. |
| 53 | " | 1630 | 3 | 5 | thro' the tube | |
| 54 | 7 | 1630 | 3 | 0 | none. | The tube was split. |
| 55 | " | 1630 | 3 | " | 1/16 of an inch. | |
| 56 | " | 2030 | 3 | " | 1/32 of an inch. | The apparatus was broken, and the tube split. |
| 57 | " | 1630 | 3 | 5 | none. | Apparatus broken. |
| 58 | " | 1630 | 3 | 4 | 1/8 of an inch | |
| 59 | " | 1930 | 2 | 6 | 1/16 of an inch. | |
| 60 | " | 2030 | 3 | 0 | 1/16 of an inch. | Broke one of the beams supporting the pullies, *f*, *f*, and parted a 3½ inch bolt rope. |
| 61 | " | 2030 | 3 | 4 | 1/4 of an inch. | The rope was broken and the tube split at the soldering. |
| 62 | " | 2030 | 4 | 0 | | Split the tube and forced out the sand in consequence. |
| 63 | " | 2030 | 4 | 0 | 1/2 of an inch. | Parted a 3⅞ inch white hemp rope. |

fitted instead of the rope. Other measures were also adopted for strengthening the apparatus.—While these arrangements were making, a series of experiments were tried with a conical plug above the piston, as in the annexed sketch The height of the cone was three inches, and its base equal to the area of the top of the piston. The details of these experiments

it is deemed unnecessary to give. Their general result was, that within the limits tried, greater resistances were obtained when the cone was used than when it was omitted.

*Observations on Table III.* The tube was of bras, cast about one-fourth of an inch thick, the interior diameter being one and one-fourth inches as far as experiment No. 111, after which it was increased to one and seven-sixteenth inches. A chain, capable of supporting nine tons, was substituted for the rope, *h*, *h*, *h*., and after experiment No. 90, a strong chain was employed in lieu of the rope, *k*, *k*. The apparatus was strengthened in a variety of ways to enable it to resist the great shocks it was subjected to. It appears from this table, that to expel seven inches of dry packed sand from a tube one and one-fourth inches in diameter, it was necessary to employ a weight of 2286 pounds falling through a space of three feet eleven inches. A weight of 2644 pounds falling three feet, was insufficient to force from the same tube eight inches of sand. Sand poured loosely into the tube, without being packed, offered much less resistance. Seven inches of loose sand was expelled by a weight of 361 pounds falling three feet eight inches; nine inches by a weight of 615 pounds, falling three feet nine inches; and ten inches by a weight of 870 pounds falling three feet ten inches. Eleven inches in a tube of one and seven-sixteenth inches bore, was expelled by 1630 pounds, falling three feet ten inches; twelve inches, by 2136 pounds, falling three feet six inches; and 2136 pounds, falling three feet nine inches, did not drive out thirteen inches of loose sand. The strength of the apparatus did not admit of carrying these trials further in this




way, and it was resolved to use gun pow

TABLE III.

| No of the experiment | No of inches of sand in the tube Packed | No of inches in sand in the tube Unpacked | Weight with which the platform was loaded | Space through which the loaded platform was allowed to fall | | Distance through which the piston was forced by the foregoing power | REMARKS. |
|---|---|---|---|---|---|---|---|
| | in | in | lbs | feet | in | | |
| 87 | 7 | | 1575 | 3 | 10 | 1 1/8 of an inch | Broke a beam over head; and on taking up the floor for the purpose of putting up new props, it was found that three of the floor joists were ruined by the severity of the previous shocks. An iron axletree, 1¼ inches in diameter, of one of the pillars, *f*, over head, was broken off. The beams supporting these pulleys were brought nearer together, and iron trunnion plates were placed under each axle to prevent its being forced into the wood. |
| 88 | 7 | | 1670 | 3 | 11¼ | of an inch | |
| 89 | 7 | | 1880 | 3 | 10 | 1 of an inch | Broke the rope *k*, *k*, connecting the chain with the sliding board *e*, under the piston. A chain was substituted in the place of this rope, and the apparatus thus made to conform in all respects, with the description which has been given of it. |
| 90 | 7 | | 2030 | 3 | | ¼ of an inch | |
| 91 | 7 | | 2230 | 3 | | 6½ of an inch | In this and all other cases where the piston was forced through the tube, a quantity of fine dust, apparently arising from the pulverization of a part of the sand, collected on the sides of the tube and at the top of the piston. |
| 92 | 7 | | 2286 | 3 | 11 | Piston forced thro' the tube. | |
| 93 | 8 | | 2286 | 3 | | 9 1/4 of an inch | Broke a large iron hook at the tube end of the large chain. |
| 94 | " | | 2490 | 3 | | 1/4 of an inch | |
| 95 | " | | 2490 | 3 | | 1-16 " | |
| 96 | " | | 2490 | 3 | | 9 1/4 of an inch | Broke the large chain in four pieces. |
| 97 | " | | 2544 | 3 | | 1/3 of an inch | |
| 98 | " | | 2644 | 3 | | none | Broke one of the hooks connecting the chain k, k, with the sliding piece, e. |
| 104 | 8 | 7 | 361 | 3 | | 8 Piston forced thro' | Broke the large chain. The apparatus could not, without considerable trouble and expense, be made to sustain the force necessary to expel 8 inche of packed sand, and the further pursuit of this inquiry was therefore abandoned. |
| 105 | 8 | 8 | 361 | 3 | | 3 25/32 inches. | |
| 106 | 9 | 9 | 615 | 3 | | 10 Pn. forced through | |
| 107 | 10 | 10 | 870 | 3 | | none | Broke the chain. |
| 108 | 10 | 10 | 870 | 3 | | 9 Pn. forced through. | Broke the chain. This chain being much strained and worn by previous shocks a new one was procured. |
| 109 | 11 | 11 | 870 | 3 | | 8 5/8 of an inch | Broke the chain. |
| 110 | 11 | 11 | 1122 | 3 | | 1 inch. | |
| 111 | 11 | 11 | 1375 | 3 | | 4 2 inches. | Broke the chain. |
| 113 | 11 | 11 | 1630 | 3 | | 10 Pn. forced through. | The interior diameter of the tube was now increased to 1 7-16 in inches, with which all the remaining experiments were made. |
| 115 | 12 | 12 | 1980 | 3 | | 3 1/4 of an in. | |
| 118 | 12 | 12 | 2136 | 3 | | 3 1/2 of an in. | |
| 120 | 12 | 12 | 2136 | 3 | | 3 1/2 of an in. | |
| 124 | 12 | 12 | 2126 | 3 | | 9 3/4 of an inch | |
| 122 | 12 | 12 | 2136 | 3 | | Pn. forced through | |
| 121 | 12 | 12 | 2136 | 3 | | 12¼ inches. | |

der; but in the meantime to determine the resistance which would be offered by the sand to the entrance of iron rods of much less diameter than the bore of the tube, the following experiments were made. Rods of one-fourth, one-half, and three-fourths of an inch diameter were used. The tube being one and seven-sixteenths inches in diameter, a wooden piston having a hole in its centre, just large enough to admit the rod a, in the manner indicated by the annexed sketch, was placed in it, and the rod being entered into the piston, the sand was placed above it as usual. With this apparatus, the experiments contained in table IV., were, among others, tried.

*Observations on Table IV.* The resistance opposed by the sand to the entrance of a rod of smaller diameter than the tube, was very great, and increased with the size of the rod. A weight of 2033 pounds was required to force a $\frac{1}{4}$ inch rod through 8 inches of sand. With 12 inches of sand, a weight of 3150 pounds was required to force the same rod, sharpened, $2\frac{1}{2}$ inches into the tube. Sharpening the $\frac{1}{4}$ inch rod, seemed rather to increase than to diminish the resistance. A half inch rod was forced through 8 inches of sand, by 870 pounds falling 4 feet. With 13 inches of sand, a $\frac{1}{2}$ inch rod was forced only $1\frac{3}{4}$ inches, by a weight of 1880 ponnds falling 3 feet 4 inches. A rod $\frac{3}{4}$ of an inch in diameter, was forced through 8 inches of sand by 1120 pounds, falling 3 feet 10 inches; and the same rod was forced through 13 inches of sand by 2136 pounds, falling 3 feet 3 inches. In all cases the sand immediately before and around the rods, was crushed to a fine powder.

TABLE IV.

| No of the experiment. | No of inches of sand. Packed. | Dead weight applied. | Falling weight. | Distance through which the loaded platform was allowed to fall. | | Distance which the iron rod was forced into the sand, by the foregoing power. | REMARKS. |
|---|---|---|---|---|---|---|---|
| | in. | lbs. | lbs. | feet. | in. | inches. | |
| Iron rod $\frac{1}{4}$ of an inch in diameter. | | | | | | | |
| 133 | 8 | 615 | | | | $\frac{1}{4}$ of an inch. | |
| 134 | " | 1150 | | | | 1 inch | |
| 135 | " | 1630 | | | | $1\frac{1}{2}$ " | |
| 136 | " | 2033 | | | | through the sand | |
| 137 | 12 | 615 | | | | 3-16 of an inch | |
| 138 | " | 1150 | | | | $\frac{1}{2}$ " | |
| 139 | " | 1630 | | | | 1 inch | |
| 140 | " | 2136 | | | | $1\frac{1}{2}$ inches | |
| 141 | " | 2480 | | | | ? | Rod bent and broken. |
| 142 | " | 615 | | | | 3-16 of an inch | In these trials the end of the rod was sharpened. |
| 144 | " | 1630 | | | | 7-8ths " | |
| 146 | " | 2390 | | | | $1\frac{3}{4}$ inches | |
| 148 | " | 3000 | | | | $2\frac{1}{4}$ " | |
| 149 | " | 3150 | | | | $2\frac{1}{2}$ " | |
| 150 | 8 | | 360 | 3 | 4 | 2 " | |
| 151 | " | | 615 | 3 | 4 | through the sand | |
| Rod $\frac{1}{2}$ an inch in diameter. | | | | | | | |
| 152 | 8 | | 360 | 3 | 6 | $1\frac{1}{2}$ inches | |
| 153 | " | | 490 | 4 | | $1\frac{3}{4}$ inches | |
| 154 | " | | 615 | 4 | | $1\frac{3}{4}$ inches | In this, and every other instance, a mass of finely pulverized sand was found at the head of the rod. |
| 155 | " | | 870 | 4 | | through the sand | The sand around the rod was pulverised to a fine powder. The rod was bent below the tube. |
| 157 | 13 | | 1120 | 3 | 3 | 1 7-8th inches | |
| 158 | " | | 1375 | 3 | 3 | $\frac{1}{2}$ an inch | |
| 159 | " | | 1880 | 3 | 6 | $1\frac{3}{4}$ inches | Bent the rod double in two places below the tube. |
| Rod $\frac{3}{4}$ of an inch in diameter. | | | | | | | |
| 160 | 8 | | 870 | 3 | 10 | $\frac{3}{4}$ of an inch | |
| 161 | " | | 1120 | 3 | 10 | through the tube | The sand around the rod crushed to a fine powder. |
| 162 | 13 | | 1120 | 3 | 9 | 7-8th of an inch | The pulverized sand at the head of the rod as usual. |
| 163 | " | | 1375 | 3 | 6 | 1 inch | The chain was broken. |
| 164 | " | | 1880 | 3 | 6 | $1\frac{1}{4}$ inches | |
| 165 | " | | 2136 | 3 | 3 | thro' the sand | |

TRIALS WITH GUN POWDER.

166. A musket barrel, of three-fourths of an inch bore, was charged with two inches of powder and thirteen inches of packed sand, there being neither wad nor plug between the sand and the powder. On firing, the barrel was burst, but the sand was not driven out.

167 & 168. A brass blunderbuss barrel of three-fourths of an inch bore, was charged with one inch of powder, and ten inches of packed sand, a wooden plug being placed between the powder and sand. On firing the plug was split, and all the sand driven out, but the pieces of the plug remained in the barrel, which was apparently uninjured. The same barrel burst with one inch of powder, and ten inches of packed sand with a conical wooden plug between the sand and the powder.

169. A pistol barrel of nine-sixteenths of an inch bore, burst with one inch of powder and eight inches of packed sand, without wad or plug.

170. An old musket barrel of three-fourths of an inch bore, was loaded with three-fourths of an inch of powder, and five inches of packed sand, without wad or plug.—On firing, the barrel was burst, but the sand was not driven out.

172. A piece of musket barrel, taken from near the muzzle, and open at both ends, was charged at one end, with five and a half inches of brick dust, hard rammed; and at the other with five and a half inches of sand, well packed, with one inch of powder between them, a priming hole being bored to communicate the fire. The explosion of the powder burst the barrel, but neither the sand nor the brick dust was driven out.

177 to 184. A pistol barrel made of twisted iron, and of great strength, the bore being eleven-sixteenths of an inch, was fired with three-fourths of an inch of powder, and the following loads of sand, each one, with and without a wad, viz: three inches, four inches, five inches, and six inches. In all these trials the sand was driven out without causing the barrel to burst.

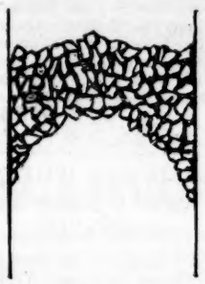
185. The same pistol barrel was loaded with one inch of powder, and eight and one-fourth inches of sand, with a conical plug between the sand and the powder. On firing, the sand was forced out.

186. The same barrel was charged with one inch of powder, and eight and one-fourth inches of sand, without wad or plug. On firing, the sand was driven out, and the barrel was burst.

In order, if possible, to determine a limit to the resistance opposed by sand, it was resolved to make use of a twenty four pound cannon. It was thought not improbable, that by the use of clean dry sand, which is generally obtained in the vicinity of the sea coast batteries, a ready method would be discovered of effectually destroying heavy guns, an object which is occasionally of great importance. Application was therefore made to the ordnance department for permission to experiment with an old pattern twenty-four pounder, laying at Fort Adams, which permission was very liberally and readily granted. The length of the bore of this piece was about nine feet, and the diameter of the bore $5\frac{82}{100}$ inches. It was first fired in a horizontal position with eight pounds of powder, and one foot of sand, afterwards with the same quantity of powder, and two feet of sand, again with the same quantity of powder, and three feet of sand, and so on, the depth of the sand constantly increasing by one foot, until the bore was full. The gun was then placed in a vertical position, and loaded with the same quantity of powder, and filled up to the muzzle with sand, well packed, without wad or plug. It was afterwards charged in a similar manner, a cone of wood being interposed between the powder and the sand. In these two cases the fire was communicated to the charge by means of a priming tube, passing down through the sand from the muzzle of the gun. Afterwards the gun was charged in the same manner, and fired by means of the vent. A better quality of powder was then used, and the quantity was increased to sixteen pounds. The gun was several times fired with this charge, the bore being filled up to the muzzle with sand well packed.—In every instance the sand was forced out

without apparent injury to the gun. It appeared, therefore, that the resistance of the sand, though very great, was not sufficient to burst a twenty-four pound cannon.

The most probable explanation of the foregoing phenomena, appears to be, that whenever direct pressure is applied, the angular and irregular shaped fragments composing the sand, immediately form themselves into a natural arch, supported against the sides of the tube. The annexed sketch indicates the manner in which this may take place. In every instance where the



sand was violently forced from the tube, the sides of it were found to be lined with a quantity of fine dust, and a mass of pulverized sand was generally found at the head of the piston A. The inside of the tube was abraded or scratched, particularly at that part, a short distance above the piston, against which the *arch*, or more strictly the *inverted dome* of sand, may be supposed to have abutted. The dust found on the sides of the tube was always of a blueish color, which was attributed to the intermixture of a small portion of metallic oxide derived from the brass. Some experiments which were made went to show that it was very important that the sand should be perfectly dry. The injurious effect of moisture may be explained by supposing that it impedes the free motion of the particles among themselves, and prevents their promptly assuming the arch form; it cements the sand into a mass, which is expelled from the tube as a solid body would be. In the case of the twenty-four pounder, it appears that the force necessary to burst the gun, was greater than that required to reduce sand to an impalpable powder, that is, to crush and destroy the materials of which the arch of sand was composed. It is probable that coarse emery, from its extreme hardness, would oppose a resistance sufficient to burst a cannon, but an opportunity has not offered to make the trial.

The experience of Fort Adams, proves that the resistance offered by sand is quite sufficient for blasting rocks, and the advantages attending it use, are, that it is much less troublesome than the usual mode, and that it is perfectly safe. To ensure success, the space left above the powder should have a length of ten or twelve times as great as the diameter of the hole. To communicate fire to the powder, a slip of paper is rolled into a tube about three-sixteenths of an inch in diameter. This priming tube is secured by being tied round in two places with thread, and one end is made a little larger than the other, so that any required length may be obtained by joining several together. The charge of powder being in its place, the priming tube is inserted and filled, it is then pressed against one side of the hole, and the sand is slowly poured in. A slender stick of hard-wood is rapidly worked up and down in the sand as it falls to the bottom, and thus every part becomes well packed. By this mode of operating there is, of course, no danger of communicating fire to the powder in the act of loading, an accident very liable to happen in blasting in the common way. The safest and most convenient method of firing the blast, is by means of a small slip of paper which has been dipped in a solution of saltpetre, and dried.

It was intended to make examinations on other points connected with the phenomena observed by M. Burnand, but the requisite leisure has not been at command. The subject merits further investigation with a view to making useful practical applications of some of the remarkable properties which sand is found to possess.

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### MINERAL MANURES.

#### *Application of Marl.*

Many farmers either lay marl upon land sown with tares, thus making a bastard fallow; or they apply it to grass land, or to a clover ley, to be broken up in the following year. The latter is certainly the preferable, as well as the most general practice, for it not alone produces an abundance o good pasture, but affords time for the season to operate in bringing the marl into a fit state for future tillage crops, which cannot be done in the common course of cropping, because it becomes buried by the plough before it is properly mixed with the soil, especially if turned in deep the first earth. It should, therefore, be allowed sufficient time to sink, and eat itself into the surface, before it is ploughed up. This, however, is by some persons carried to an absurd length, as they occasionally spread a coat of marl upon the green sward, and leave it there unploughed for many years, in which case the grass receives considerable detriment, for the marl then sinks downwards in a body, without incorporating with the soil; though, when it has lain a long time in this state, the subsequent crops of corn have been found to be enormous.* If laid upon grass, it may be carried out during all periods of the year in which the crop is not in a forward state of growth; but if applied to arable land intended for immediate cultivation, the months of June and July, or soon after the autumn seed-time, are considered the best for its application. If laid on a short time previous to winter, its effect is also generally prompt, because, except it be of a very tenacious kind, the action of the cold and rain commonly divide it in time, to be thoroughly amalgamated with the soil by the tillage of a summer fallow. If, however, it be only applied during the spring months, this cannot be so properly carried into execution, for it requires the winter's rain and frost to crumble it, and it consequently has but little power upon the year's crop. A complete summer fallow is, undoubtedly, the best mode of bringing it into perfect operation: but not only is the expense often objected to, but there is also a strong prejudice entertained by many persons against fallowing—into which it is not our present object to inquire, although we necessarily shall have occasion to notice it hereafter.

It is almost superfluous to add, that, in whatever manner it be applied, it must be equally spread over the land; and if there should be any larger lumps remaining, these should be broken with mallets, or clotting-beetles, in the same manner as chalk, before it is ploughed in. This, however, is not usually done until the marl has partaken of both one summer's sun and one winter's frost; and should the previous season have proved unfavorable to the reduction of marl to small particles, the process, in some cases, costs so much, that, when laid upon grass or clover, it is often found more advisable to leave the ground unbroken during another year. Then, when well crumbled, dry weather should be chosen for rolling and harrowing it—a first time with heavy rollers and drags, and a second, after it has been exposed to rain, and has been again dried: in short, until it has been rendered as small as possible; after which it should be lightly ploughed in, again harrowed, and receive from two to four ploughings, according to the condition of the soil. The intermixture of the marl with the earth cannot, in fact, be too complete; for whatever proportion remains uncombined with the soil, will not alone fail of producing the intended effect, but will have one of an opposite and prejudicial tendency.

The quantity of marl which it may be prudent to apply to the land depends entirely on the nature of the soil, and the prpoerties of the marl: the more calcareous is the latter, the greater is the effect which it will produce, as a stimulant; and shell marl possesses, besides, the additional power of nourishing the soil by the vegetable and animal mould with which it is combined. This species was formerly profusely used on every sort of ground, but at present the average amount applied to land of the medium kind is from 30 to 40, or if it be very light, only 25 cartloads, of 16 cubic feet per acre. Land of the latter quality may, indeed, be readily overmarled; as by repeated marling, in large quantities, the surface of poor ground may be rendered so loose that, in some cases, it has not afforded a sufficient hold to the roots of corn and grass.* Double the quantity may, however, be laid upon strong cohesive soils, for it is not so easy to give them too large a dose; but if cold, wet, or moorish, great circumspection is requisite in the application of this marl, for if the land be not previously well drained, it will only increase its tenacity.

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* Perth Report; and Appendix to that of Cheshire, No. 3.

[To be continued.]

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*Dickson's Original Report of Lancashire, Stevenson's edit., p. 409.

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It has been discovered that some of the Indian timber is singularly durable. The wood called the *jarrool* has the property of resisting the marine worms which commonly attack ships where they are not defended by copper. On a recent occasion they were found to have fastened on every description of wood forming the bottom of an unsheathed vessel save the jarrool, not even sparing the teak. The day is consequently not distant when jarrool will make a more important article of commerce than it hitherto has been.—(Observer.)

LABORERS WANTED.—The following notice for laborers is worthy of notice by those who desire to be employed during the winter. It is now an easy matter to reach *Augusta*.

ONE THOUSAND LABORERS WANTED TO WORK ON THE GEORGIA RAILROAD.—The above number of men can find immediate employment on the *Georgia Railroad*, at $20 per month, and found.

The work passes through an elevated dry country, which is as healthy as any part of the United States. The winter is remarkably mild and pleasant, being seldom colder than the latter part of October is in New York.

The road extends from Augusta to Athens. Passage for the first named place, can be obtained in vessels going to Charleston or Savannah, whence there is daily communication to Augusta. Cost of passage to Augusta, including fare, about $15.

J. EDGAR THOMSON, Agent.

Augusta, Oct. 3. 1836.

## FRAME BRIDGES.

THE subscriber would respectfully inform the public, and particularly Railroad and Bridge Corporations that he will build Frame Bridges, or vend the right to others to build, on Col. Long's Patent, throughout the United States, with few exceptions. The following sub-Agents have been engaged by the undersigned who will also attend to this business, viz.

| | |
|---|---|
| Horace Childs, | Henniker, N. H. |
| Alexander McArthur, | Mount Morris, N. Y. |
| John Mahan, | do do |
| Thomas H. Cushing, | Dover, N. H. |
| Ira Blake, | Wakefield, N. H. |
| Amos Whitemore, Esq., | Hancock, N. H. |
| Samuel Herrick, | Springfield, Vermont. |
| Simeon Herrick, | do do |
| Capt. Isaac Damon, | Northampton, Mass. |
| Lyman Kingsly, | do do |
| Elijah Halbert, | Waterloo, N. Y. |
| Joseph Hebard, | Dunkirk, N. Y. |
| Col. Sherman Peck, | Hudson, Ohio. |
| Andrew E. Turnbull, | Lower Sandusky, Ohio. |
| William J. Turnbull, | do do |
| Sabried Dodge, Esq., | (Civil Engineer,) Ohio. |
| Booz M. Atherton, Esq. | New-Philadelphia, Ohio. |
| Stephen Daniels, | Marietta, Ohio |
| John Rodgers, | Louisville, Kentucky. |
| John Tillison, | St. Francisville, Lous'a. |
| Capt. John Bottom, | Tonawanda, Penn |
| Nehemiah Osborn, | Rochester, N. Y. |

Bridges on the above plan are to be seen at the following localities, viz. On the main road leading from Baltimore to Washington, two miles from the former place. Across the Metawamkeag river on the Military road, in Maine. On the National road in Illinois, at sundry points. On the Baltimore and Susquehanna Rrailroad at three points. On the Hudson and Patterson Railroad, in two places. On the Boston and Worcester Railroad, at several points. On the Boston and Providence Railroad, at sundry points. Across the Contocook river at Hancock, N H. Across the Connecticut river at Haverhill, N. H. Across the Contoocook river, at Henniker, N. H. Across the Souhegan river, at Milford, N. H. Across the Kennebec river, at Waterville, in the state of Maine.—Across the Genesse river, at Mount Morris, New-York, and several other bridges are now in progress.

The undersigned has removed to Rochester, Monroe county, New-York, where he will promptly attend to orders in this line of business to any practicableextent in the United States, Maryland excepted.

MOSES LONG.
General Agent of Col. S. H Long.

Rochester, May 22d, 1826. 19y-tf.

## AMES' CELEBRATED SHOVELS, SPADES, &c.

300 dozens Ames' superior back-strap Shovels
150 do do do plain do
150 do do do cast steel Shovels & Spades
150 do do Gold-mining Shovels
100 do do plated Spades
50 do do socket Shovels and Spades.

Together with Pick Axes, Churn Drills, and Crow Bars (steel pointed,) manufactured from Salisbury refined iron—for sale by the manufacturing agents,

WITHERELL, AMES & CO.
No. 2 Liberty street, New-York.
BACKUS, AMES & CO.
No. 8 State street, Albany

N. B—Also furnished to order, Shapes of every description, made from Salsbury refined Iron. 4—ytf

## RAILWAY IRON, LOCOMOTIVES, &c.

THE subscribers offer the following articles for sale.

Railway Iron, flat bars, with countersunk holes and mitred joints,

| | | | | | | lbs. | |
|---|---|---|---|---|---|---|---|
| 350 tons | 2½ | by | ½, | 15 ft in length, | weighing | $4\frac{68}{100}$ | per ft. |
| 280 " | 2 | " | ½, | " | " | $3\frac{50}{100}$ | " |
| 70 " | 1¼ | " | ½, | " | " | 2½ | " |
| 80 " | 1¼ | " | ½, | " | " | $1\frac{25}{100}$ | " |
| 90 " | 1 | " | ½, | " | " | ⅝ | " |

with Spikes and Splicing Plates adapted thereto. To be sold free of duty to State governments or incorporated companies.

Orders for Pennsylvania Boiler Iron executed.

Rail Road Car and Locomotive Engine Tires, wrought and turned or unturned, ready to be fitted on the wheels, viz 30, 33, 36, 42, 44, 54, and 60 inches diameter.

E. V. Patent Chain Cable Bolts for Railway Car axles, in lengths of 12 feet 6 inches, to 13 feet 2½, 2¾ 3, 3¼, 3½, 3¾, and 3¾ inches diameter.

Chains for Inclined Planes, short and stay links, manufactured from the E. V. Cable Bolts, and proved at the greatest strain.

India Rubber Rope for Inclined Planes, made from New Zealand flax.

Also Patent Hemp Cordage for Inclined Planes, and Canal Towing Lines.

Patent Felt for placing between the iron chair and ston block of Edge Railways.

Every description of Railway Iron, as well as Locomotive Engines, imported at the shortest notice, by the agency of one of our partners, who resides in England for this purpose.

Mr. Solomon W. Roberts, a highly respectable American Engineer, resides in England for the purpose of inspecting all Locomotives, Machinery, Railway Iron &c. ordered through us

A. & G. RALSTON.
28–tf Philadelphia, No. 4, South Front st.

## NOTICE TO CONTRACTORS.

PROPOSALS for excavating and embanking the Georgia Railroad from the upper end of the work, now under contract, to Greensboro', a distance of 34 miles, will be received at the Engineer's Office, at Crawfordville, on the 21st and 22d days of October next.

—ALSO—

At the same time, for the Branch to Warrenton, 4 miles. And if prepared in season, the Branch to Athens, length 37 miles.

J. EDGAR THOMSON,
33—t22o Civil Engineer.

## NOTICE TO CONTRACTORS.

PROPOSALS will be received at the Engineer's Office, in the city of Lancaster, on Wednesday, the 19th day of October next, for the Excavation, Embankment, Wall, &c, required on twenty-five miles of the Susquehanna Canal, commencing at Kline's run, (three miles below the Columbia Bridge,) and extending along the West side of the Susquehanna river, to the "Maryland State Line."

The work will be ready for examination by Contractors, at any time after the 25th inst., and the Map, Profile and Specification, may be seen at the office, one week previous to the letting.

The unusually heavy character of the work, (which affords excellent winter jobs,) offers great inducements for the attendance of Contractors possessing energy and enterprise.

It is expected that the extension of the Canal to "Tide Water," will be ready for letting about the 1st of December.

No mechanical work to be let at present.

EDWARD F. GAY,
Chief Engineer, S. C.

Lancaster, Sept. 13, 1836. 5t—38
1¼ square $4 12

## NOTICE TO CONTRACTORS.

HARTFORD AND NEW-HAVEN RAILROAD.

For the purpose, alone, of a more widely extended notice, the letting of the Northern Division of the HARTFORD AND NEW-HAVEN RAILROAD, will be deferred until the 15th of October next. Up to that day, inclusive, proposals will be received at the Engineer's Office (corner of East and Collis sts. New-Haven,) for the excavation, embankment, masonry and carpentry, necessary to prepare the road for the reception of the superstructure.

Maps, profiles, plans, and specifications, may be examined at the Engineer's office; and printed forms may be obtained by application at the same place, giving a general view of the nature and amount of the work of different kinds which is to be done.

ALEXANDER C. TWINING,
Engineer.

New-Haven, Sept. 20, 1836. 39—3t

## ALBANY EAGLE AIR FURNACE AND MACHINE SHOP.

WILLIAM V. MANY manufactures to order, IRON CASTINGS for Gearing Mills and Factories of every description.

ALSO—Steam Engines and Railroad Castings of every description.

The collection of Patterns for Machinery, is not equalled in the United States. 9—1y

## ARCHIMEDES WORKS.

(100 North Moor street, N. Y.)
NEW-YORK, February 12th, 1836.

THE undersigned begs leave to inform the proprietors of Railroads that they are prepared to furnish all kinds of Machinery for Railroads, Locomotive Engines of any size, Car Wheels, such as are now in successful operation on the Camden and Amboy Railroad, none of which have failed—Castings of all kinds, Wheels, Axles, and Boxes, furnished at shortest notice.

H. R. DUNHAM & CO.
4—ytf

## RAILROAD CAR WHEELS AND BOXES, AND OTHER RAILROAD CASTINGS.

Also, AXLES furnished and fitted to wheels complete at the Jefferson Cotton and Wool Machine Factory and Foundry, Paterson, N. J. All orders addressed to the subscribers at Paterson, or 60 Wall street, New-York, will be promptly attended to.

Also, CAR SPRINGS
Also, Flange Tires, turned complete
18 ROGERS, KETCHUM & GROSVENOR

## STEPHENSON,

*Builder of a superior style of Passenger Cars for Railroads.*

No. 264 Elizabeth street, near Bleecker street, New-York.

RAILROAD COMPANIES would do well to examine these Cars; a specimen of which may be seen on that part of the New-York and Harlaem Railroad now in operation J25tt

## PATENT RAILROAD, SHIP AND BOAT SPIKES.

☞ The Troy Iron and Nail Factory keeps constantly for sale a very extensive assortment of Wrought Spikes and Nails, from 3 to 10 inches, manufactured by the subscriber's Patent Machinery, which after five years successful operation, and now almost universal use in the United States, (as well as England, where the subscriber obtained a patent,) are found superior to any ever offered in market.

Railroad Companies may be supplied with Spikes having countersink heads suitable to the holes in iron rails, to any amount and on short notice. Almost all the Railroads now in progress in the United States are fastened with Spikes made at the above named factory—for which purpose they are found invaluable, as their adhesion is more than double any common spikes made by the hammer.

*** All orders directed to the Agent, Troy, N. Y., will be punctually attended to.

HENRY BURDEN, Agent.
Troy, N. Y., July, 1831.

*** Spikes are kept for sale, at factory prices, by I. & J. Townsend, Albany, and the principal Iron Merchants in Albany and Troy; J. I. Brower, 222 Water street, New-York; A. M. Jones, Philadelphia; T. Janviers, Baltimore; Degrand & Smith, Boston.

P. S.—Railroad Companies would do well to forward their orders as early as practicable, as the subscriber is desirous of extending the manufacturing so as to keep pace with the daily increasing demand for his Spikes. (1J23am) H. BURDEN.

## NEW ARRANGEMENT.

ROPES FOR INCLINED PLANES OF RAILROADS.

WE the subscribers having formed a co-partnership under the style and firm of Durfee, Coleman & Co., for the manufacturing and selling of Ropes for inclined planes of railroads, and for other uses, offer to supply ropes for inclined planes, of any length required without splice, at short notice, the manufacturing of cordage, heretofore carried on by S. S Durfee & Co., will be done by the new firm. All orders will be promptly attended to, and ropes will be shipped to any port in the United States.

8th month, 8th, 1836. Hudson, Columbia County, State of New-York.

E. S. TOWNSEND, GEORGE COLEMAN,
ROBT. C. FOLGER, SYDNEY S. DURFEE
33—tf.